

February 1988

U.S.A. \$3.95

Canada \$4.50

UK £2.50

An IDGCI Publication

AMIGA

WORLD

BRIDGING THE GAPS

Amiga—IBM:
Compatible At Last!

Amiga—C64:
Upgrade Paths

Turbocharge
Your 2000



02



0 74470 65948 8





V | D E O

Cell Animator



PROFESSIONAL ANIMATION! —

Now take advantage of "pencil testing" your animation in the privacy of your own home studio! With Cel Animator you can preview scenes, polish your work and know it performs the way you envisioned.

UN-EQUALLED VERSATILITY —

Cel Animator provides versatility that's unavailable with film, or the expensive Lyon-Lamb type stop-motion video tape equipment. With Cel Animator, your drawings are stored on a computer disk so each frame can be called up repeatedly and manipulated within a sequence after being "shot" only once. This is achieved because computer disk storage is "random access," meaning; any information stored on the disk can be called up at random, in whatever order required, as often as necessary!

BREAK THE "SEQUENTIAL" DILEMMA —

Tape and film are "sequential" and require you to shoot a "cycle" over and over again until the required number of repetitions are completed, or re-expose a held drawing for many consecutive frames. Using Cel Animator, however, you may simply create each drawing once, and then create a list, identifying each frame by number, and the program will call up the stored frame from memory and replay it as often as it is called for, or in whatever order you specify, and you can add or delete drawings. Essentially, the program follows your "exposure sheet" for you!

You can also experiment with your timing by simply changing the display time between frames; if you shoot a "pose test" you can adjust your timing repeatedly without reshooting anything, then add your breakdowns, re-time your delays and check again. No need to add in-betweens until you've fine-tuned your pose test.

CONTINUOUS PLAY OPTION —

The program can also replay your sequence of frames in a continuous loop, so you can sit back and review the action repeatedly without having to rewind and play a video tape over and over again, or without ever having to wait for film to be shot, processed, and edited.

SOUND SYNCHRONIZATION —

Cel Animator allows you to digitize your pre-recorded sound track (dialogue, music or effects), and replay them frame by frame; or select any group of frames to replay, enabling you to locate and identify sounds according to frame number prior to doing your animation drawings. Then, review your pose test or completed animation synchronized with your digitized sound track, and you can then print an exposure sheet, vowels and consonants paired with frame numbers.

INTRODUCE COLOR! —

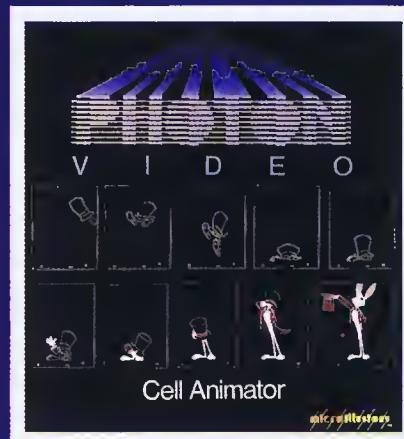
Finally, if you own one of the many paint programs available such as Photon Paint, you can paint your pencil drawings right on your computer, and use Cel Animator to replay them in full color, over any background you create. It is also possible to send your completed color scenes to video tape; thus producing a full color animated sequence right in your own home on your VCR or you can use Photon Video's Transport Controller software.

COMPATIBILITY —

Photon Video Products are fully compatible with most third party art, animation and rendering software systems.

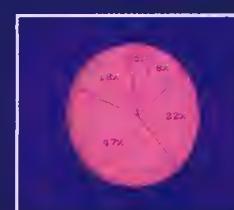
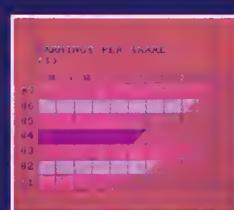
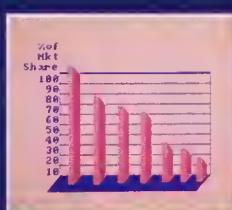
TRANSPORT CONTROLLER —

This module allows you to take your animations frame by frame to video tape, by way of popular frame by frame controllers such as Lyon Lamb.™



OTHER PHOTON VIDEO PRODUCTS —

- EDIT 3D, Photon's powerful solid object Editor.
- RENDER 3D, Photon's amazing solid object rendering system.
- Photon Paint, this immense paint system gives you all you are accustomed to in a professional paint box, plus many advanced features like surface mapping and light source control!



microillusions™

17408 Chatsworth St., Granada Hills, CA 91344 Inside CA 818/360-3715, Outside CA 800/522-2041

Circle 138 on Reader Service card.



ONLY DIGI PAINT CAN DO ALL THIS

Get the maximum graphics power from your Amiga. Create stunning, lifelike computer artwork with Digi-Paint, the first full-featured 4096 color (Hold and Modify) paint program. Break the "32 color barrier" and finally realize the potential of your Amiga with Digi-Paint's advanced features:

- 4096 colors on screen simultaneously
- NewTek's exclusive enhanced HAM mode
- Dithered HAM gradient fill
- Full screen effects including double, half size, mirror reverse and more
- Full IFF and Digi-View compatibility
- Use 320x200 or HAM hi-res 320x400 resolutions
- Fat bits Magnify mode
- Rectangle, oval, line and other drawing tools
- 12 different paint modes including blending, tinting and smooth shading
- Full lasso cut and paste with automatic edge blending
- Programmed completely in assembly language for fast, smooth response

Find out why Byte Magazine called Digi-Paint "Remarkable". Available now at your local Amiga dealer or call:
1-800-843-8934.

ONLY \$59.95

NewTek
INCORPORATED

The world isn't limited to black & white. Why should you be?

Shakespeare™ brings the power of color desktop publishing to your Amiga™ computer. With it you can design a color brochure, produce a multi-page newsletter, create a flashy flyer, integrate charts from a spreadsheet into a business report, and turn a simple letter into a colorful document.

With Shakespeare™ you can:

Mix graphics from any IFF source using any set of colors, and print all graphics in their correct colors • Edit text on-screen and change color, style, fonts • Crop and size graphics • Cut, paste, copy, and delete text • Flow text around graphics and overlay graphics in transparent or opaque modes

Shakespeare™ provides:

Global page layout options • Graphics toolbox for creating border, hairlines, and rules • Grids • On-line help • Full page preview mode with multi-page option • Unlimited document size • Support for all Amiga™ compatible printers and Postscript™ devices • Full multi-tasking • Library disk with clip art, fonts, and professionally designed sample layouts

Available now! Color Desktop Publishing Without Limits

INFINITY

Infinity Software, Inc.
1144 65th Street, Suite C
Emeryville, CA 94608
415/420-1551

Suggested Retail: \$225
Not Copy Protected.

Amiga is a registered trademark of Commodore-Amiga, Inc.
Postscript is a registered trademark of Adobe Systems, Inc.
PaintJet is a registered trademark of Hewlett-Packard, Inc.
©1987, Infinity Software, Inc.

WIN A HEWLETT-PACKARD PAINTJET™ COLOR GRAPHICS PRINTER!

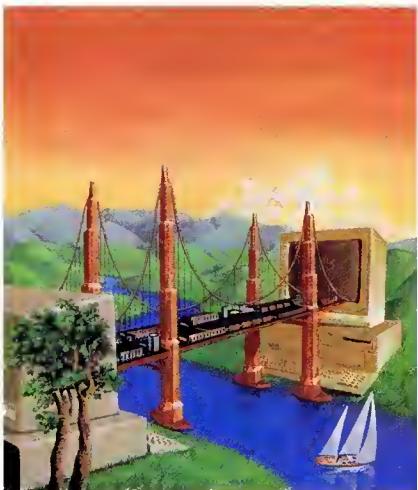


Color desktop publishing demands great color printing. Infinity Software announces the Shakespeare desktop publishing contest. It's easy to enter. Imagine yourself as William Shakespeare. Create his colorful one page resume using *Shakespeare™*, the color desktop publishing program. Resume must include graphics and be written in the style of the times. First prize is a Hewlett-Packard PaintJet™ Color Graphics Printer. Entries must include hardcopy and disk files.

All entries must be postmarked by February 1, 1988 and become the property of Infinity Software.



C O N T E N T S



Making connections to other worlds might be a good handle for this month's theme—at least other computing worlds... Bridging the long-standing gap between the Amiga and the IBM PC... Within the Commodore realm, moving between C-64/C-128 and Amiga... Getting beyond the standard 68000 microprocessor to new heights of speed and performance. The Amiga is definitely not a one-box world.

FEATURES

- | | |
|---|----|
| BRIDGE OVER TROUBLED WATERS <i>By Louis R. Wallace</i> | 20 |
| Commodore's A2088 Bridgeboard may be the long-awaited solution in achieving Amiga-IBM compatibility. | |
| TURBOCHARGING YOUR AMIGA 2000 <i>By Bob Ryan</i> | 26 |
| The 68020 CPU Board from CSA can provide dramatic increases in speed and performance for Amiga power users who have serious graphics and number-crunching applications. | |
| YOU CAN'T GET THERE FROM HERE <i>By Guy Wright</i> | 34 |
| The upgrade path is still a rocky road for C-64/C-128 users who want to move up to the Amiga without abandoning their old equipment and software. Is there anything out there to help smooth the way? | |

ARTICLES

- | | |
|--|----|
| SWAPPING DATA...CLIPBOARD-STYLE <i>By David T. McClellan</i> | 45 |
| You can make far better use of your Amiga's multitasking capabilities if you learn to use a much-neglected Exec device—the Clipboard—to add useful cut-and-paste functions to your applications. | |
| BASIC BY THE NUMBERS <i>By Bob Ryan</i> | 59 |
| Our new series on programming your Amiga with Amiga Basic continues with some helpful advice on how to use loop structures to get a lot more out of your programming and save valuable time. | |
| ZEITGEIST | 6 |
| Our editor has been up in the ozone layer a lot recently, jetting back and forth to a number of shows—and it shows in his writing this month. | |
| INFO.PHILE <i>By William B. Catchings and Mark L. Van Name</i> | 51 |
| If you didn't think number-crunching was part of your favorite computer's repertoire, check out some Amiga spreadsheet offerings right here. | |

DEPARTMENTS

- | | |
|---|----|
| REPARTEE | 8 |
| Give him something to bring us on his appointed rounds. | |
| NOTE PAD | 10 |
| Heavy action in our news bureaus, with coverage of several major shows and exhibitions. | |
| HORS D'OEUVRES | 14 |
| Hints and techniques... of the readers, by the readers, for the readers. | |
| REVIEWS | 67 |
| AudioMaster / Multi-Forth / Reason / Butcher / Doug's Math Aquarium.
Games: Arazok's Tomb / Phantasie III / The Black Cauldron. | |
| WHAT'S NEW? | 82 |
| New York, New Jersey, New Products... | |
| HELP KEY | 88 |
| Dear Abby, My Amiga has been acting a little strange lately.... | |

THE DIRECTOR™

Professional display and animation language for the Amiga™

Envision a creative freedom you've only *dreamed* about. Imagine page flipping, color cycling, text generation, even IFF ANIM animations, all combined at *the same time* on the same screen. Now, from the simplest slideshow to the most sophisticated desktop video production, that dream comes true with the Director.

- Use any IFF images, any resolution, any number of colors
- Fades, Dissolves, Blits, Wipes, Stencils
- Page flip full or partial screens
- Preload images, fonts and sounds up to your memory limit
- Flexible script-based structure
- Basic-like vocabulary: For/ Next, Gosub/ Return, If/ Else/ Endif
- Arithmetic expressions, random number generator, variables
- Execute AmigaDOS commands from the script
- Text string and file input and output
- Keyboard and mouse interaction
- Digitized soundtrack module
- Supports HAM and overscan
- Supports IFF ANIM playback
- Built-in drawing commands
- No copy protection
- And much more . . .

**DEMO DISKS \$10 each
Probe Sequence (512k)
RGB (1 meg)**

\$69.95

Check or money order
payable to: Right Answers
Plus \$3 shipping and handling,
Calif. residents add 6% sales tax



The Right Answers Group
Department D
Box 3699
Torrance, CA 90510
(213) 325-1311

Amiga is a trademark of Commodore-Amiga, Inc.

Circle 204 on Reader Service card.

ATTENTION AMIGA USERS! IMPORTANT NOTICE!

You are probably aware of other disk magazines out there, BUT do you know how much a truly well-organized disk magazine can REALLY offer? PD SOFTWARE DIGEST can show you the honest answer.

We are technically supported by expert Amiga users at MIT, and financially sponsored by the generous donation of Digital Media Publications, Inc. As the result, we can offer you the most at the lowest cost.

As a subscriber to PD SOFTWARE DIGEST, you will receive a disk package every month, bringing you the most exciting software the newest information concerning your Amiga. To let you know more about PD SOFTWARE DIGEST, we have prepared a \$2.50 Subscriber's Trial Disk for you. This disk contains ready-to-run programs and useful articles from our past issues. After you know more about us, we are confident that you will want to receive more of our coming disk packages at similar low prices.

But don't take our words for it—try out a sample disk and see for yourself! You won't find a lower price anywhere. Offer expires Feb. 15, so don't miss this opportunity. Request your trial disk TODAY!



Send \$2.50 and a self address stamped envelope (with 39 or 44 cent postage affixed) to PD SOFTWARE DIGEST, MIT Branch P.O. Box 315, Cambridge, MA 02139. Your request will be processed within the same day.

Publisher
Stephen Twombly

Editor-In-Chief
Guy Wright

Managing Editor
Shawn Laflamme

Technical Editor
Robert M. Ryan

Senior Editor
Linda J. Barrett

Senior Editor
Dan Sullivan

Review Editor
Barbara Gefvert

Contributing Editors

*Bill Catchings,
Peggy Herrington,
David T. McClellan,
Mark L. Van Name,
Lou Wallace*

Art Director

Rosslyn A. Frick

Assistant Art Director

Howard G. Happ

Designers

*Anne Dillon
Roger Goode*

Production Assistant

Ruth Benedict

National Sales Manager

Stephen Robbins

Sales Representative

Kenneth Blakeman

Advertising Coordinator/

Pull Down Menu

*Heather Paquette
1-800-441-4403*

West Coast Sales

*Giorgio Saluti, manager
1-415-328-3470*

Danna Carney

Pull Down Menu/Sales Assistant
3350 W. Bayshore Road, Suite 201
Palo Alto, CA 94303

Secretary

Sandy Kierstead

Marketing Manager

Wendie Haines

Marketing Assistant

Laura Livingston

Business Manager

Barbara Harris

Customer Service

Representative

Lisa LaFleur

President/CEO
Michael S. Perlis

Vice-President/General Manager
Roger Murphy

Group Publisher
Consumer/Home Magazines
Stephen Twombly

Director of Corporate Production

Dennis Christensen

Typesetting Manager
Linda P. Canale

Typographer
Doreen Means

Manufacturing Manager

Susan Gross

Director of Circulation
Frank S. Smith

Circulation Manager
Bonnie Welsh

Direct Marketing Manager
Paul Ruess

Newsstand Sales
Linda Ruth

Direct Sales Manager
*Elizabeth R. Kehn
800-343-0728*

Director of Credit Sales & Collections
William M. Boyer

AmigaWorld (ISSN 0883-2390) is an independent journal not connected with Commodore Business Machines, Inc. **AmigaWorld** is published monthly by CW Communications/Peterborough, Inc., 80 Elm St., Peterborough, NH 03458. U.S. subscription rate is \$24.97, one year. Canada \$47.97 (Canadian funds), one year only. Mexico \$29.97 (U.S. funds drawn on U.S. bank), one year only. Foreign \$44.97 (U.S. funds drawn on U.S. bank), one year only. Foreign Airmail, please inquire. Second class postage paid at Peterborough, NH, and at additional mailing offices. Phone: 603-924-9471. Entire contents copyright 1987 by CW Communications/Peterborough, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. **Postmaster:** Send address changes to **AmigaWorld**, Subscription Services, PO Box 868, Farmingdale, NY 11735. Nationally distributed by International Circulation Distributors. **AmigaWorld** makes every effort to assure the accuracy of articles, listings and circuits published in the magazine. **AmigaWorld** assumes no responsibility for damages due to errors or omissions.



GOLD DISK

COMIC SETTER



YOU CAN CREATE YOUR OWN MULTI-PAGE COMIC BOOKS WITH
ComicSetter - THE COMPLETE COLOR COMIC DESIGN STUDIO
FOR THE 512K AMIGA. WITH STRUCTURED AND BIT-MAPPED
GRAPHICS. ONLY \$99.95 FROM GOLD DISK SOFTWARE. SEE YOUR
LOCAL AMIGA DEALER, OR CALL 1-800-387-8192 TO ORDER.

ZEITGEIST

"Who do I talk to about the great job you guys are doing?"

I'VE BEEN TO a number of shows in the past month or two (AmiExpo, Northeast Computer Faire, Comdex) and it was good to see the excitement, meet some of you readers in person, shoot a few pictures, see some new products, talk to some of the advertisers and get out of New Hampshire for a few days. AmiExpo was a madhouse, Northeast Computer Faire was a morgue, and Comdex was more business oriented. When you stand around the booth or just wander around the exhibit floor, people come up and talk, ask questions, make suggestions, criticize, compliment, etc. I got a lot of similar comments and questions that you probably would have asked if you saw me. Since everyone didn't go to these shows I thought I would re-create the experience for you.

Here I am standing at the *AmigaWorld* booth. Tall, thin, fuzzy hair, beard (I grew back my beard since the last photo printed in *Zeitgeist*). Most of you don't recognize me except those who see me at various shows and events. You almost walk past the booth but then notice the blow-up of one of our covers on the wall and the piles of *AmigaWorlds* on the counters.

"Oh... *AmigaWorld*," you say.

At this point there are usually two sorts of scenarios:

A. You turn to your friend or your friend turns to you or you mutter to no one in par-

ticular as you flip casually through a copy of the magazine. "I used to subscribe, but there isn't anything worth reading in *AmigaWorld*. All fluff. _____ magazine has better stuff." (Fill in the blank.) At that point you usually wander off not really wishing to confront anyone at the booth directly. If you do hang around, the questions are usually something like:

"Commodore owns you guys, right?" or "How come you never say anything negative about a product?" or "Why don't you guys do more technical stuff and/or program listings?"

No, Commodore doesn't own *AmigaWorld*. They don't come close to supporting us (the total number of ads Commodore placed in *AmigaWorld* in 1987 was two). They don't really trust us. How much inside information we get from Commodore depends on who is currently in charge. Sometimes they tell us what is going on and sometimes we are last on the list. We don't have developer status and aren't invited to developer conferences on a regular basis. We don't say a lot of negative things about Commodore because it would serve no purpose. We don't say a lot of negative

things about the Amiga because we like the Amiga and it would be self defeating. We want the Amiga to succeed as much as Commodore does. We do say negative things about

products that are bad no matter who manufactures them or how many ads they take out.

As far as our technical coverage goes, we don't do hardware projects or Forth or Modula II—there just aren't enough people interested (when we get our first thousand letters about any of these we will start running articles on them; until then all our surveys indicate we are at just the right level).

I don't think we will ever fill the pages of *AmigaWorld* with program listings. I don't think that is what the majority of the readers want. (If it IS what you want, then let me know.) Nothing is set in stone and we try to give you what you want.

The other group of people who come up to the booth to talk usually say something like:

"*AmigaWorld*. You guys are doing a great job. The magazine has gotten a lot better recently. I like the Hors d'oeuvres/ Reviews/ features/ *Zeitgeist*/ Call for Authors/ buyer's guides/ comparative reviews (whatever). Keep up the good work, and when are you going to do a story on word processors/ desktop-publishing packages/ music/ video/ Basic programming. . . ."

"We will be doing stories, and entire issues, on all of these topics in '88."

"Glad to see you guys are finally going monthly. Does that mean my subscription is going to run out sooner?"

"Yes. Your original subscrip-

tion was for six issues. You will still get those six issues, it will just take half the time."

And then we get reactions from people who advertise in the magazine:

"Thanks for the review in your _____ issue."

"Why didn't we get a review in the _____ issue?"

"We strongly disagree with your review of our product in the _____ issue."

"Our product should be shipping in about a week/ month/ few months/ spring/ as soon as the manual is printed. Who do we send it to?"

"Barbara Gefvert. Review Editor."

"Who do I talk to about the great job you guys are doing?"

"Me. Guy Wright. I'm the Editor-in-Chief."

"YOU are Guy Wright? Don't you write *Zeitgeist* or something?"

"And Call for Authors, and some reviews, and stories, and I put together Hors d'oeuvres. Yes, I'm Guy Wright."

"I really liked your editorial a few issues back."

"Thanks."

"You have a great magazine."

"Thanks. We have fun doing it and I think it shows."

"Well, nice to meet you."

"You too."



CINEMAWARE
PRESENTS

MOE

the THREE STOOGES™

Can THREE Stooges
Save ONE orphanage
From FOREclosure?!

OUR HEROES
They can save the day
by making ASSETS
of themselves!

THE EVIL BANKER
He took their NEST EGG
and told them to BEAT IT!

THE WIDOW AND HER 3 BEAUTIFUL DAUGHTERS
They're about to be thrown out on their ARREARS!



"NYUK, NYUK."
"OH, A WISE GUY!"
"RUFF! RUFF!"

Producers ROBERT & PHYLLIS JACOB
Computography by INCREDIBLE TECHNOLOGIES

MASTER DESIGNER SOFTWARE
presents

THE THREE STOOGES

Actual Amiga Screens



NOW PLAYING AT A SOFTWARE DEALER NEAR YOU

Available for Amiga, Commodore 64, IBM PC, Apple IIgs, and Atari ST, which are trademarks respectively of Commodore-Amiga, Commodore Electronics, Ltd., International Business Machines, Apple Computer Inc., and Atari Inc.
Cinemaware Corporation, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362

REPARTEE

Comments, complaints and concerns

from AmigaWorld readers.

DEFUNCT DEAL

IN THE NOV. '87 Notepad ("Random Access," p. 10), you reported that Commodore was not giving any deals on an upgrade from the 1000 to the 2000. My local dealer said Commodore was offering \$1,000 off the Amiga 2000 for those who traded in their Amiga 1000. So, I traded in my 1000 and received a 2000 for \$1,000. I don't know if this offer is available everywhere, but I see all the Amiga dealers in Michigan are giving the same deal.

Doug Krueger
Walled Lake, MI

We weren't aware of this trade-in policy at the time we went to press with the November issue. We received several letters from people around the country who got the same deal. It was called the "1000 + \$1000 = 2000" program: all you had to do was bring in your A1000 system to your authorized Amiga dealer and you would be given \$1,000 credit toward your purchase of the Amiga 2000. Unfortunately, this offer expired on November 30, 1987.

—Editors

A VOTE FOR THE 1000

LET ME CAST my vote in the dispute over the new Amigas. I just bought a new Amiga, upgrading from a C-128. Knowing full well what I was doing,

I chose the Amiga 1000 over both the 500 and the 2000.

The 1000 has proven itself and is well supported by third-party developers. It is fully expandable up to eight megabytes and its operating system isn't locked up in ROM. The 2000 is extremely over-priced: You could get an expanded 1000 and an IBM compatible for that kind of money! Due to the 500's problem with complex graphics (when expanded with the A501 card), not to mention its wimpy external power supply, I instantly ruled out that machine.

All in all, I feel the new Amigas are a positive step in support of the 1000's continued success, and I hope they do well. However, for my money, I chose the 1000.

John Megehee
Tulsa, OK

DREAM MACHINE

I AM SOMEWHAT astounded by my fellow Amiga owners' reactions to the 500 and 2000. Upgrades and redesigns are the order of the day in this industry. Witness the changes in the Macintosh world (I28, 512, 512E, Mac+, SE, Mac II) in the few years of its existence.

Anyone who buys any digital equipment will see it eclipsed at a lower price within months. This is cause for celebration, not wrath. Were such change not so, I would be diddling front panel switches to input hex on a

very expensive homebrew 4K 8-bit while hoping that the oscillators in the huge monophonic synth would remain stable long enough to record one track in real-time—that is if I could even afford such a setup. Thanks to this ongoing change, a machine that was the substance of dreams only a few years ago is now available for an undreamed of price.

Larry N. Bolch
Anchorage, AK

have tried to load on the Amiga using the 1541 drive and interface, only about six or seven finished loading. (Some of the programs had copy protection and some did not.)

Of the few programs that did load, all were unusable due to screen distortion or drastic reductions in speed. There may be a C-64 program that will work with The 64 Emulator, but I haven't found it.

Upon telling my complaints to ReadySoft, their answer was "Sorry, all sales are final."

I am aware that you are not responsible for products advertised in your magazine, but I thought that you should be aware of how bad this product is.

Greg Brady
Pascagoula, MS

These products (and others) are reviewed in this issue. See Guy Wright's article "You Can't Get There From Here," p. 34, which discusses possibilities for upgrading from the C-64/C-128 to the Amiga. We highly recommend that you read this article before making any buying decisions. (By the way, the 64 Bus is now called Access-64 and is marketed by Progressive Peripherals Inc.)

—Editors

I HAVE A problem with one of your advertisers. ReadySoft Inc. has a product called The 64 Emulator. I purchased one along with the interface. This product is a rip-off!

Of more than 30 programs I

Send your letters to: Repartee, AmigaWorld editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

CINEMaware
PRESENTS

ROCKET RANGER

SEE THE BEAUTIFUL YOUNG DAUGHTER
OF A FAMOUS SCIENTIST—
HELD CAPTIVE BY A GANG OF
GODLESS GOOSESTEPPERS!

Only YOU can stop the
Interplanetary Spread
of Jet-Propelled
NAZI FACISM!

A Master Race
from Outer Space
threatens the Fate of
the Free World!

Directed by Kelly Beck

Actual Amiga Screens

Ranger™ Robert Jacob • Produced by Tom...
© 1988 Cinemaware Corporation

NOW PLAYING AT A SOFTWARE DEALER NEAR YOU

Available for Amiga, Commodore 64, IBM PC, Apple IIgs, and Atari ST, which are trademarks respectively
of Commodore-Amiga, Commodore Electronics, Ltd., International Business Machines, Apple Computer Inc., and Atari Inc.
Cinemaware Corporation, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362

NOTE PAD

Edited by Linda Barrett

Club Commodore's New Act

FRANK SINATRA AND Sammy Davis Jr., Sigfried and Roy, Max Toy and Amiga were the names that lit up the Las Vegas sky last November at COMDEX time. While the others played the big-name casinos, CEO Max Toy and the Amiga staged their act for the exclusive afternoon crowd at Club Commodore.

Obviously no stranger to sales performance, as he's fresh from successful gigs with Compac and IBM, Toy thrilled the hundreds of Amiga dealers and



Commodore's crowded Comdex booth.

sales reps with his monologue. He did have good material, grabbing the audience from the first with the flashy Amiga Test Flight video backed by talk of Commodore's new profitability. According to Toy, the company introduces more people to computers than any other hardware manufacturer; as proof he called on their installed-base of 10 to 12 million users worldwide. A fountain of figures, Toy then claimed that while the Macintosh had some 250 software titles two years into its life, the Amiga in the same interval had over 800. (*AmigaWorld's December '87 Buyer's Guide* weighed in at 665 titles, but perhaps 135 have been introduced since then.)

Apparently saving some hot material for his next act, Toy declined to provide details on forthcoming Commodore products, disclosing only that several are in the works: an AT-compatible bridge card, a 68020 board and a genlock for the A2000, as well as a hi-res monitor. He did admit that Commodore underestimated the demand for Amiga 500s and 2000s, fielding questions about availability. At the close of his routine, Toy invited the audience to wander through the floor show next door, where the hall was full of developers demonstrating their wares for interested dealers and sales reps.

The mood was decidedly upbeat (partially owing to the complimentary drinks and hors d'oeuvres at the end of the day), and Max Toy's act received rave reviews. The highlight of the day was watching the fast-talking CEO steal the microphone (not to mention the show) from Commodore veterans Frank Leonardini and Rich McIntyre. While I couldn't help wondering if he was getting paid by the word, Toy and the Amiga should have a long run together.

—Peggy Herrington

Beyond the Three-Piece Suits

COMDEX IS USUALLY a show dominated by three-piece attired IBMers and a few hundred high-end peripheral manufacturers. While there is a lot going on, anyone interested in Commodore and the Amiga can cover the show in about one day. Fall '87 Comdex wasn't much different than previous shows—except for the Commodore booth. As if Commodore's even being there wasn't different enough, their booth was completely devoted to the Amiga.

According to Commodore

representatives the booth's official theme was "Only Amiga Makes it Possible." For most of the show attendees who wandered by the large, always crowded display of Amiga software and hardware, the theme was closer to "Rediscovering the Amiga." People knew about the Amiga's capabilities, but they were astounded all over again by the demonstrations going on at the booth.

Commodore shared their booth with third-party developers, arranged in sections, each designed to show off an

aspect of the Amiga, but the individual pieces of hardware and software weren't the show stoppers. It was the interrelation of that hardware and software that was making people slow down and gape. A video frame buffer captures images and saves them in IFF format for a paint program to modify, a digitizer works with the paint program which works with an animation program which works with a genlock. Other computers can perform these separate operations, but cannot integrate the results.

Each individual product was impressive but the total effect of the Commodore booth was stunning. People were walking away shaking their heads saying things like: "I knew the Amiga was capable of some interesting stuff but all this is unbelievable. The Amiga sure has come a long way in just two years."

Comdex is more than crowded booths and demonstrations, however. When the hall closes, discussions move to the cocktail parties. Such was the case at the *AmigaWorld* reception at the Alexis Park Resort. A few hundred developers showed up to talk, drink and eat—mostly talk. While each developer had their particular views on the current state of Amiga affairs, all of them seemed to sense a

lot of activity in the market. Commodore is promoting machines. Products that were promised months ago are actually shipping, and the blanks are filling. Manufacturers who had put their Amiga products on the back burner for a while were talking about rekindling the fires and getting back into the Amiga market. People who had products for other computers were saying that they were ready to start stepping up Amiga conversions. Even a number of Atari ST, Macintosh and MS-DOS developers were impressed by things they had seen at the Commodore booth or at the developer's conference that Commodore held earlier.

Commodore is marketing the Amiga, sales are up and hard-

ware and peripherals are getting more professional. Since sophisticated products are thriving in the Amiga markets, there must be a user base interested in more than just playing

games. Both the party and the show's moods were upbeat. Pushed by all that excitement, the Amiga product floodgates will open wider and wider.

—GW

Simply Outraegis '87

AGAINST THE ROMANTIC backdrop of an ornate rococo frieze in Los Angeles' Mayfair Theater, a half dozen Amiga monitors sat in a staged flurry of pumpkins and autumn leaves. Last October Outraegis '87 was more than a showcase for Aegis' products; it was a Who's Who gathering of the Amiga firmament. While Amigas lighted the stage with multi-colored desktop videos, the panel of Amiga luminaries perched on large felled logs—Gary Bonham (VideoTitler, coming soon), Stuart Ferguson (Modeler 3-D, Aegis' object editor), John Foust (Syndesis), Martin Hash (Animator: Apprentice), Allen Hastings (VideoScape 3-D), Jim Sachs (Defender of the Crown) and Bill Volk, Aegis Vice President of Technical Development.

There was more to look at than people and pumpkins, however. Besides their new video programs, Aegis previewed four games. "So What's the Big Deal?" by Jim, Jeremiah and Michael O'Flaherty won the Outraegis video contest, while Allen Hastings' "Apocalypse Real Soon Now" and Jim Sachs' "20,000 Leagues Under the Sea" besieged the limits of computer video. Richard Lewis showed how the Amiga Invaded network TV on *Max Headroom*, and Cris Palomino provided a glimpse of the new show *Secrets and Mysteries of the Universe*, starring Edward Mulhare and the Amiga.

Besides the glow of demos and videos, the air was filled with speeches. During the panel discussion, the question of animation standards sparked a heated exchange. Bill Volk capped the argument, saying "If you're at all interested in animation, get on BIX, with the Amiga Dev IFF discussion. It's a roundhouse of people screaming at each other at

times, but things do get settled as far as animation standards and file formats. It's a bloody war out there on other systems, and the Amiga is an island of calm where you can actually take a painting and import it into 20 other programs. This doesn't exist anywhere else."

Commodore VP Rich McIntyre peered into the crystal ball of corporate marketing, announcing future promotional efforts would focus on desktop presentation. McIntyre predicts that by the end of '88 there will be more Amigas in the world market than the installed base of C128s.

Souvenirs were everywhere—Outraegis T-shirts, Outraegis pens and even an Outraegis jack-o'-lantern. While last year's accessories are collectors items, you can stock up on the hot '88 T-shirt fashions this fall.

—Ben and Jean Means



Master of 3-D, Allen Hastings.

Looking for a Few Good . . . Developers

ONCE THE DOMAIN of powerful supercomputers and superminis, professional digital image processing is now available for the Amiga in the form of the Amiga Parallel Imaging Coprocessor. Developed by the Center for Productivity Enhancement at the University of Lowell (MA), the Parallel Imaging Coprocessor is an expansion card for the Amiga 2000. Employing up to 7 UPD7281 Image Pipeline Processors (for a theoretical 35 Million Instructions Per Second), the coprocessor board, directed by a C runtime library or the University's Image Kernel System (IKS), can perform a nearly unlimited number of image processing tasks.

"Commodore shouldn't call this [the Amiga 2000] a personal computer," says Rich Miner of the Center, "it's actually a personal workstation." The Parallel Imaging Coprocessor is the first in the Center's series of image and video enhancement products.

The Parallel Imaging Processor is a hardware implementation of the IKS. The University hopes to establish IKS as a standard imaging system, providing a common set of imaging tools for different devices. When run on a host that can support its functions in hardware, it will drive the imaging device. If no hardware exists, IKS does (relatively slow) software imaging.

Plans to market the Parallel Image Coprocessor and the IKS are incomplete. "Creating a commercial product is not our primary goal," says Miner. "This project enhances the reputation of the Center while providing students with the kind of practical experience not found in a classroom." Contact Rich Miner at the Center for Productivity Enhancement, University of Lowell, One University Ave., Lowell, MA 01854. 617/452-5000 ext. 2693.

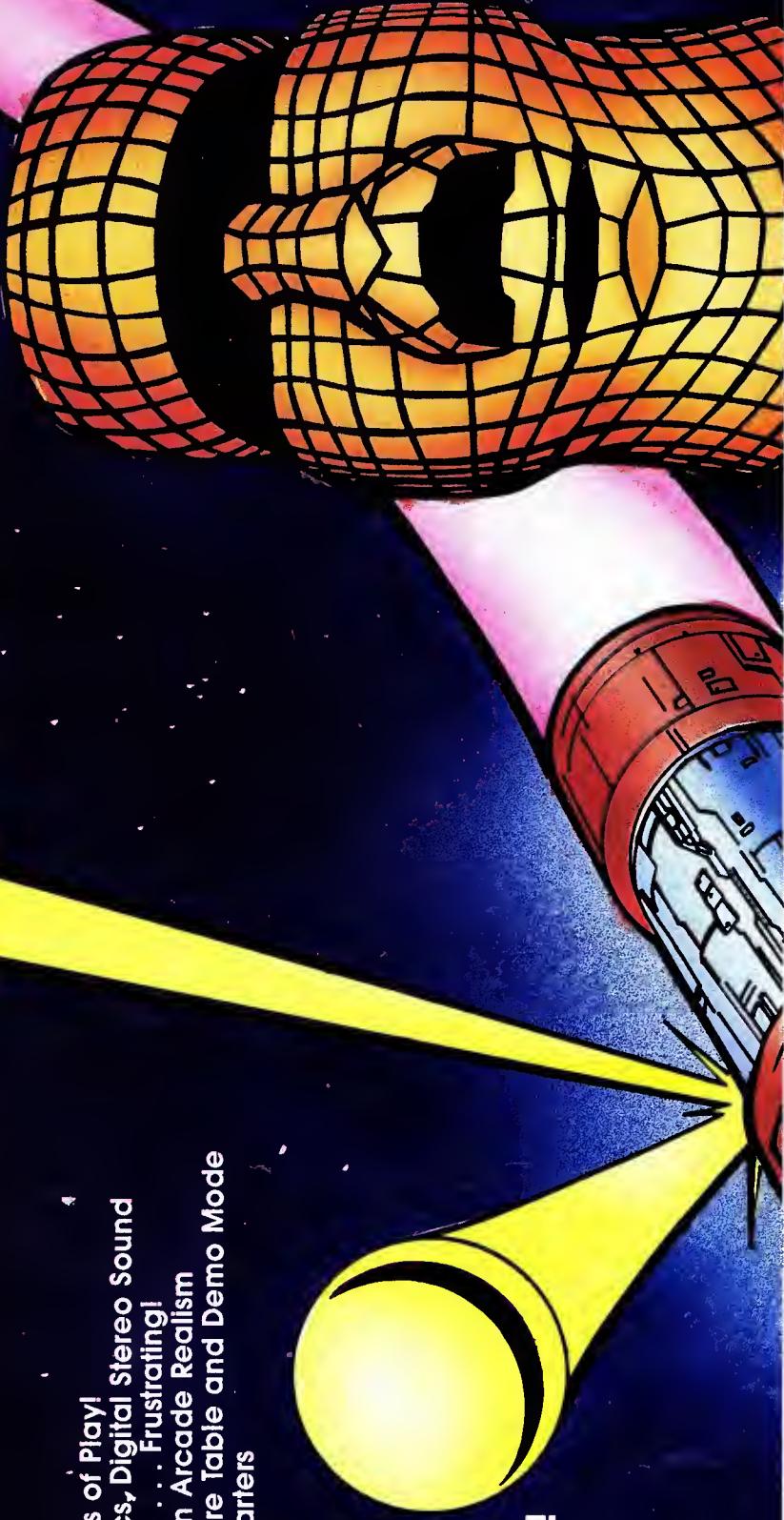
—RR

TM



THE #1 ARCADE BLOCK-BUSTER!

- 33 sizzling Levels of Play!
- Dazzling Graphics, Digital Stereo Sound
- Fast! Fun! Furious! . . . Frustrating!
- A Breakthrough in Arcade Realism
- Arcade High Score Table and Demo Mode
- Never Needs Quarters



ONLY \$49.95 • !



Licensed from
TAITO AMERICA CORPORATION



NEW! From
DISCOVERY
SOFTWARE
INTERNATIONAL

SIMPLY THE BEST AMIGA GAME EVER!

Taito® and Arkaneid™ are trademarks of Taito America Corporation. ©1987 Taito America Corporation. All rights reserved.



"Marauder II is an excellent utility at a bargain price."

Bob Ryan-Amiga World

"Every Amiga owner should have a copy . . ."

Bruce Webster-BYTE

"If you own an Amiga and don't have Marauder II from Discovery, you don't have one of the best tools an Amiga owner can have." -INFO Magazine

The best copier for Amiga™ at any price! Still only **\$39.95***

NEW! **DX SERIES**



LIMITED TIME OFFER!
ORDER DIRECT AND GET
\$5.00 OFF
EACH PRODUCT YOU BUY
PLUS

ABSOLUTELY FREE!!

TO ORDER CALL TOLL FREE
1-800-34-AMIGA

Or **(301) 268-9877**

or send check, cash or
VISA or MasterCard numbers to:
Discovery Software International Inc.
163 Conduit Street
Annapolis, MD 21401

*Order now for \$5 introductory discount!
(Federal Express shipping in continental U.S. only.)

Amiga™ is the trademark of Commodore-Amiga, Inc. UNIX™ is the trademark of Bell Laboratories Inc., HP-16C™ and HP-11C™ are trademarks of Hewlett Packard Co.

Circle 39 on Reader Service card.

OFFER SUBJECT TO CHANGE WITHOUT NOTICE

HORS D'OEUVRES

Hints, tips and techniques

from your fellow Amiga users.

MORE AND MORE STARTUP SPEEDUPS

OVER THE COURSE of months of adding and deleting files on my Workbench disk, I began to realize that the loading time for my startup sequence was approaching one minute. This is because AmigaDOS scatters files throughout the disk in pieces when there is insufficient room in one place for the entire file. The way to remedy this is to use the COPY ALL command to make a backup copy of the disk. Files are copied sequentially and contiguously onto the new disk, resulting in reduced seek time during reads.

First, format the destination disk. Then from CLI, type:

```
COPY source name TO destination name
    ALL QUIET
```

The QUIET command is optional; it kills the display of filenames as they are copied. If you want to watch the files as they are copied, just leave off the QUIET. This is a slow process, so sit back and wait.

Using this method I was able to reduce my startup sequence time from 56 seconds to 46 seconds. As a bonus, I gained a significant reduction in the amount of time required for icons to appear in the disk's window.

I discovered one other timesaver connected with the startup sequence and was able to shave off another three seconds by simply specifying complete pathnames in every command line of my startup-sequence file. Instead of the usual:

```
RUN PopCLI
```

I used the complete pathname to tell AmigaDOS where to find each command and/or file:

C:RUN C:PopCLI

Using these two tips, I have reduced the speed of my startup by 13 seconds, an improvement of nearly 25 percent. Of course, your mileage may vary.

*Cletus Baker
Council Bluffs, IA*

EVEN MORE STARTUP SPEEDUP

HERE IS YET another speedup for your startup-sequence on 1.2 Workbench disks. This will definitely work with a standard 512K, single or dual drive, Amiga 1000. It should also work if you have a printer and/or modem.

In the S directory of the standard Workbench 1.2 disk, you can remove the following lines marked here with an asterisk:

```
* echo“Workbench disk. Release 1.2
      version 33.47”
* echo“ ”
* echo“Use Preferences tool to set
      date”
* if EXISTS sys:system
      path sys:system add
* endif
* if EXISTS sys:utilities
      path sys:utilities add
* endif
* BindDrivers
Loadwb
EndCLI >nI:
```

The first, second and third lines just display messages that we all know by heart. The fourth, sixth, seventh and ninth lines involve searching for directories that are already on a standard system disk. Why search for something we know is there? The BindDrivers command involves the addition of non-standard hardware. Why try to add non-

standard hardware when we know it is not there?

If you don't feel safe removing the lines from your startup sequence, then just convert them to comments, so if you ever need them, you can convert them back to executable lines.

*Alan McKay
Stellarton, N.S. Canada*

Editor's Note: This tip might cause problems during some operations with some disks or with some hardware add-ons, but nothing drastic. When trying either of these last two tips, remember: ALWAYS WORK WITH A BACKUP COPY, NEVER YOUR ORIGINAL WORKBENCH DISK!

MULTI-LIGHTNING LINES

TELL ALL YOUR readers to use surge suppressors on ALL wires that connect the Amiga to the outside world. During a recent thunderstorm my Amiga was killed. I had unplugged the computer, but I forgot about the modem line. Don't do as I did. Buy a \$20 telephone line suppressor. It is much cheaper than a new computer.

*Steve Olson
Madison, SD*

Editor's Note: Even safer and cheaper, unplug EVERYTHING during a thunderstorm. Lightning can jump almost anything, even a line suppressor.

DAK CAMERA UPDATE

I TOOK THE advice of J. Forman (*Inexpensive Video Camera, AmigaWorld July/August 1987*) and ordered the Magnavox Home Security camera for use with DigiView. Unfortunately, I did not check carefully when I telephoned DAK Industries to order. I found out the hard way ►

Amiga Makes It Possible...

Desktop Video.

Studio quality video production on a desktop. The Amiga makes it possible. The **SuperGen Genlock** makes it happen!

Video Professionals understand the power the Amiga Computer brings to the industry and the potential it has for enhancing their work. With its revolutionary hi-resolution graphics and processing power, the Amiga represents a sophisticated video production solution.

The SuperGen Genlock and overlay device is the link between the Amiga's video potential and your own video productions. SuperGen allows you to create and produce **professional broadcast quality video** with special effect graphics and titles created on your Amiga.

Some SuperGen™ features:

True Broadcast quality video output.

Real RS-170A. No ifs, ands or buts!
Accurately locks to non-time base corrected signals such as VCR output.
Very accurate RGB encoder for true Amiga graphic colors.

Two independent fade controls.

For external video through background and external video through graphics.
Slider or software controllable.

Selectable Auto-Fade mode.

Amiga graphics black level fade.
The black level of the Amiga graphics determine the fade level.

Switchable 3.58Mhz Notch filter.

helps eliminate chroma artifacts.

Selectable blanking.

Internal or external.

BNC Connectors.

A500, 1000, and 2000 compatible.

SuperGen™ \$749.95
Professional Genlock

SuperGen Makes it Happen!



Actual un-retouched photographs of composite video screens.
The flower is live video, the Butterfly is created on the Amiga.
SuperGen is overlaying the Butterfly onto the flower.
The top sequence shows Amiga graphics fading in.
The bottom sequence shows the Amiga background fading in.

To order or for more information Call:

(916) 344-4825

**1333 Howe Ave.
Suite 208**

Sacramento, CA 95825



**Digital
Creations**

why the camera is "inexpensive." It has no power source of its own. It gets its power through the monitor which sells as a unit for \$299. The camera on its own is completely useless. I now have a camera that I cannot use. If I had gone ahead and ordered the camera from NewTek as I had planned on doing before I saw this tip, I would be far better off.

The other annoying part of all this is that DAK Industries does not export their goods to Canada; therefore, I had to make a 600-mile trip to pick up the camera, which wasn't so bad as I was going on a holiday anyway. But in order to pick up the monitor (at additional cost, of course), I would have had to make a special trip of another 600 miles.

As you can guess, I am not amused.

*Darlene Rogers
Courtenay, B.C. Canada*

Editor's Note: We have tried to find an external power supply for the Magnavox camera but have come up empty. It is always a good idea to check carefully before you buy anything mail order (although, in this case, one would naturally assume that the camera had its own power supply). The two lessons here are: First, when ordering products through the mail, always check on their return policy (in case you have to return something you're not happy with), and second, we can't check everything submitted to Hors d'oeuvres, so use these tips with a bit of caution.

BASIC SUB SEARCH

THIS IS FOR all you Amiga Basic users who write programs over 5000 bytes long. You have probably noticed that it takes a long time to scroll through a program to find a certain block of code. Sure, you could sprinkle your programs with labels and type LIST *label name* to display the block, but if you are like me, you write subprograms instead of subroutines (subprograms can't be listed with the LIST command), and forget the labels. Fear not, there is a quick and easy way to find your way through a program without growing old.

The first step is to set up the program with the label name in a comment line. To do this, click the mouse at the beginning of the line with the label, press shift right arrow twice, and type a comment line (preceded with '). Do this for all subroutines, subprograms and any other important program lines. Just the label

name is all that is needed; too much comment will slow down the display. Press ALT left arrow to return to the listing. For best results, the listing window should be opened to its fullest width and the program should be written so that no lines are wider than the listing window.

To use, press shift right arrow twice and use the shift up arrow and shift down arrow to move through the program until the label is found. Finally, press ALT left arrow to display the program code.

As an example of listing speed, an 18,500-byte program took one minute and eight seconds to list using shift down arrows, and only 13 seconds using my quick way.

*Richard Bennett
Bethel, CT*

KEYBOARD BUFFER UPDATE

IN THE SEPT/OCT 1987 Hors d'oeuvres there is a keyboard buffer update giving a good, clean-cut way to clear the keyboard buffer. I would like to point out, however, that the code works fine and is smaller when only used a few times in a program. If you are going to need to clear the buffer at four or more places in a program (i.e., you are going to type the code in four or more times), the following is better:

```
SUB ClrBuf STATIC
    WHILE INKEY$>"" : WEND
    END SUB
```

You would call this ClearBuffer routine from your program with this line:

Clrbuf

Believe me, it works. Besides using less memory for four or more instances of Clearbuffer code, this code keeps in the spirit of using subprograms to keep programs from being archaic.

*Gregory Kendall
Woodstock, GA*

1.1 TO 1.2 MADE EASIER

IN THE JULY/AUGUST 1987 Hors d'oeuvres, Brian Whitworth describes how to change a Version 1.1 disk to a formatted 1.2 disk and install it. This does allow for faster file access, but it's still a 1.1 disk. To take advantage of the

RAMdisk icon and the other improvements of 1.2, you need the new libraries and devices. Use ED to create this file:

```
COPY DF0:libs TO DF1:libs ALL
COPY DF0:l TO DF1:l ALL
COPY DF0:devs/#?.device to DF1:devs
```

Save this file to your Workbench 1.2 disk with a name like CONVERT1.2. Typing EXECUTE CONVERT1.2 will change any disk in DF1:. Some old software may not work with the new libraries. Work on backups only!

*David Cox
Flint, MI*

CLI OR WORKBENCH? PROMPT

I HAVE A general-purpose Workbench disk from which I sometimes load Workbench and other times go directly to CLI. To simplify the process, I put the following commands at the end of my startup-sequence file:

```
:
:
:
ECHO "Load Workbench? Y <return>
      or <return>"
```

```
FAILAT 25
MAKEDIR > NIL: ?
FAILAT 10
IF EXISTS y THEN
DELETE y
LOADWB
ENDCLI > NIL:
ENDIF
```

This sequence prompts me and then waits for input to the MAKEDIR command. I must be careful not to enter anything other than y<return> for Yes or just <return> for No, or I will get an unwanted directory built. The FAILAT 25 command keeps me from getting an error from MAKEDIR when just a <return> is entered. This procedure substitutes for the lack of a query capability in CLI and can be modified to ask any kind of Yes/No question in a CLI command file.

*Jay McDaniel
Las Vegas, NV*

VIDEO CLOCK COUNTER

NO DOUBT YOU'VE noticed that the counters on video cassette recorders vary widely from machine to machine. ►

the new MaxiPlan Plus...



**it's making every other
spreadsheet old fashioned!**

The original MaxiPlan™ was named the Best Amiga™ Spreadsheet of 1986 by F.A.U.G., the world's largest and most active Amiga user group. Now in 1987, Oxxi is proud to introduce MaxiPlan Plus™—the most advanced Amiga spreadsheet ever. With even more time-saving innovations than the award-winning MaxiPlan, the new MaxiPlan Plus includes Microsoft Excel™-like Macros and Utilities.

With MaxiPlan Plus and your Amiga you can:

- Open multiple spreadsheets and graphs
- "Link" data from any number of spreadsheets
- Create a self-running demo or interactive multiple choice quiz, incorporating files from word processors and paint programs
- Automatically create reports such as invoices and purchase orders

- Instruct a data entry person with speech or written prompts
- "Recite" your data entries when checking data accuracy against source documents
- Export graphs via an IFF file to any Amiga paint program

The MaxiPlan Plus Spreadsheet features:

- 512 columns by 65,530 rows
- Function key commands
- Ranges or cells referenced by "Name" or cell numbers
- Written or spoken notes that attach to cells or ranges
- Password protected cells
- Easy-to-use pie, bar, line and area graphs
- Up to 8 graphs per spreadsheet
- Lotus 1-2-3 compatibility
- 63 built-in functions such as:
 - Financial (IRR, PV, NPV, FV, PMT)
 - Data base (Index, Find, Lookup)
 - Presentation (Color, Style, Speech)

With the MaxiPlan Plus Data Base you can:

- Sort on any number of fields in any order
- Maintain up to 16 data bases per spreadsheet
- Create merge files for labels or form letters
- "Find" or "Lookup" any specific record or records

With the MaxiPlan Plus Macros you can:

- Define up to 32 macros for any spreadsheet
- Activate macros with a single key stroke
- Automatically generate macros under record mode
- Use over 70 different macro commands
- Create templates for data entry
- Incorporate speech to instruct, remind or inform user

MaxiPlan Plus™

\$199.00
at your local Amiga software dealer.

OXXI inc.

P.O. Box 4000
Fullerton, CA 92634
(213) 427-1227



MaxiPlan

Named the best Amiga spreadsheet of 1986 for its outstanding mouse interfaces, unique pull-down menus and advanced speech capabilities.

Excel is a trademark of Microsoft Corp.

Counter numbers from tapes logged on one VCR won't match up when you play the tape back on another VCR. This can be maddening when you take the tape of your desktop video somewhere else for editing.

In the professional TV production world, something called SMPTE Time Code is used to give a numeric (digital) name and address to virtually every frame of video. Because it's highly standardized, the Time Code numbers will

be the same on any machine in that format. They'll even remain the same when the video information is transferred between tape formats, if the proper equipment is used during dubbing. It's the electronic equivalent of optical edge numbering in film. Using Time Code is always expensive, hence out of reach for the average independent (or home) production.

If you have a genlock and two VCRs, try this the next time you make working

copies of your stuff (something you should always do anyway, just like you do with your original disks).

Connect the outputs of the playback deck to the genlock inputs. Connect the output (audio and video) of the genlock to the inputs of the second (record) VCR. Connecting the output of the record VCR, either to a monitor or a TV for monitoring, is a very good idea.

Call up the clock on your Workbench disk. Change it to digital format. Next, bring up the preferences screen and set the clock to 11:59 pm. Put your original videotape in pause just about five seconds before the beginning of program material to be recorded. Put the record deck into record. Now you should have your Workbench screen, with the digital clock superimposed on top of your videotape signal.

When the digital display of the clock approaches 11:59:55, take both decks out of pause at the same time. Within three to five seconds, everything will be up to speed and "locked," as they say, by 00:00:00. This will leave you with a pretty good time-to-picture reference on your newly-recorded copy to make an accurate log by. It won't be perfect, but you'll find that when you take the original tape or tapes into the edit session, the edit controller will be reading the control track pulses off the tape and converting them into hrs:min:frames. If you zero the edit controller readout at about the same place as where you started your "clocking" on your work copy through the genlock, searching and finding places on your original will be a breeze if you've made good notes during logging. Since you pay by the hour for editing, quick search times can save you a lot of money during the edit session.

Jim Passin
Chicago, IL

Editor's Note: This technique should be fine for any video work that you might need timing on (a track meet finish, surveillance/security cameras, real-time data acquisition, etc.).

*If you have an idea you'd like to share with our readers, send it to AmigaWorld
Hors d'oeuvres, 80 Elm St., Peterborough, NH 03458. If your idea gets published, you'll receive an AmigaWorld T-shirt for your efforts. (Don't forget to tell us your T-shirt size.) ■*

1-427

microfiche photography

of the plant cell wall —

micro-fiche *'mikrō, fēsh* [F. fr. *micr-* + *fiche* index point, fr. *ficher*, *fichier* FICHU] : a sheet of microfilm containing rows of images

micro-fiche re-mia

Manage Your Data... Not Your Database.

Introducing... the **MICROFICHE filer™** *The Graphic Database*

With our unique software, your data is organized as on a microfiche—as a condensed two-dimensional sheet of text and pictures over which you drag a "magnifying glass" to locate your information.

At last—a Database that fully utilizes the Graphics capabilities of your Amiga! Unlike inferior database programs, the Microfiche Filer allows you to store pictures of any size. You can also display several pictures simultaneously and mix pictures with text.

Some Additional Features:

- POWER
- FLEXIBILITY
- CONFIGURABILITY
- RELIABILITY

Full-powered sorting, selecting, and printing. Fields may be added or deleted at any time. Adaptable forms with which to display data. Not copy protected.

You can now own the **MICROFICHE filer** (plus shipping) for just **\$99.**

SHIPPED SAME DAY when ordered with MasterCard or VISA!

CALL TOLL FREE **800-527-7014**

In MA (617) 877-1266

to order or for location of nearest dealer.

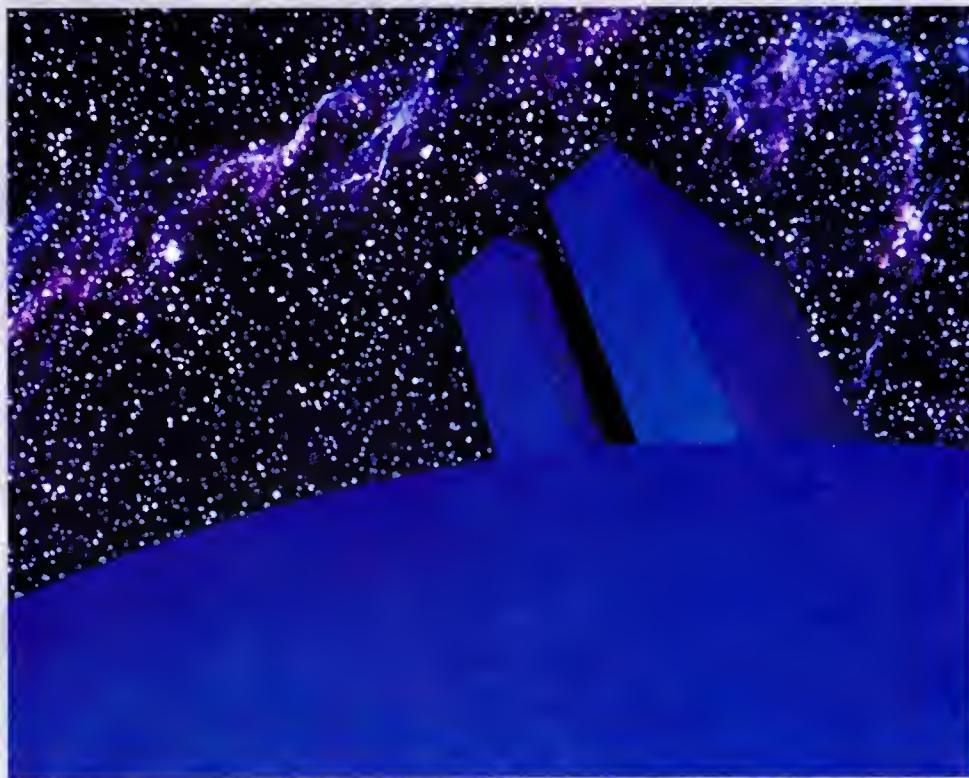
MasterCard

VISA

Software Vision Inc.
26 FOREST ROAD, FRAMINGHAM, MA 01701

Circle 10 on Reader Service card.

AMIGA OWNERS:



Discover new worlds within your Amiga™

The 64 Emulator broadens the horizons of your Amiga with access to thousands of programs written for the Commodore 64. Yes, the proven word processors, databases, spreadsheets and exciting games can now be run on your Amiga.

Written in 100% 68000 machine code for maximum speed, the 64 Emulator takes full advantage of your Amiga's hardware to support all aspects of the Commodore 64 including sound and color. A monochrome mode allows you to turn off the color for increased speed.

All Amiga disk drives and printers are fully supported. The easy-to-use transfer software makes moving your 64 programs to Amiga disks a snap! For increased compatibility with protected software, the optional Serial

Interface connects any Commodore 64 disk drive and printer to your Amiga.

Why wait for an expanded range of Amiga software when you can take immediate advantage of quality software already chosen by six million other computer owners? The 64 Emulator by ReadySoft ...here, now, and ready for you.

DEALER INQUIRIES INVITED

Canadian Orders:
3520 McNicoll Ave., Unit 2-238
Scarborough, Ontario CAN M1V 2T0

PHONE ORDERS
(416)731-4175

Please have credit card number ready

YES

I want to use the thousands of Commodore 64 programs on my AMIGA. Please rush me:

The 64 Emulator @ \$39.95 (\$49.95 Cdn.)
 The 64 Emulator with Serial Interface @ \$59.95 (\$79.95 Cdn.)
(Please specify computer below)
I own Amiga 500 Amiga 1000 Amiga 2000

Payment by Check Money Order Visa Mastercard

card no. exp. signature

Please add \$3.00 (\$4 Cdn.) for shipping and handling. Ontario residents please add 7% P.S.T. No C.O.D. please.

Name _____

Address _____

City, Town _____ Zip _____ State _____

To:
ReadySoft Inc.
P.O. Box 1222
Lewiston, N.Y.
14092



THE 64 EMULATOR FOR YOUR AMIGA

\$39.95

Commodore is a registered trademark of Commodore Electronics Limited. Amiga is a registered trademark of Commodore-Amiga, Inc.

Due to the nature of the Amiga, some 64 programs may not operate with The 64 Emulator.

Circle 24 on Reader Service Card.

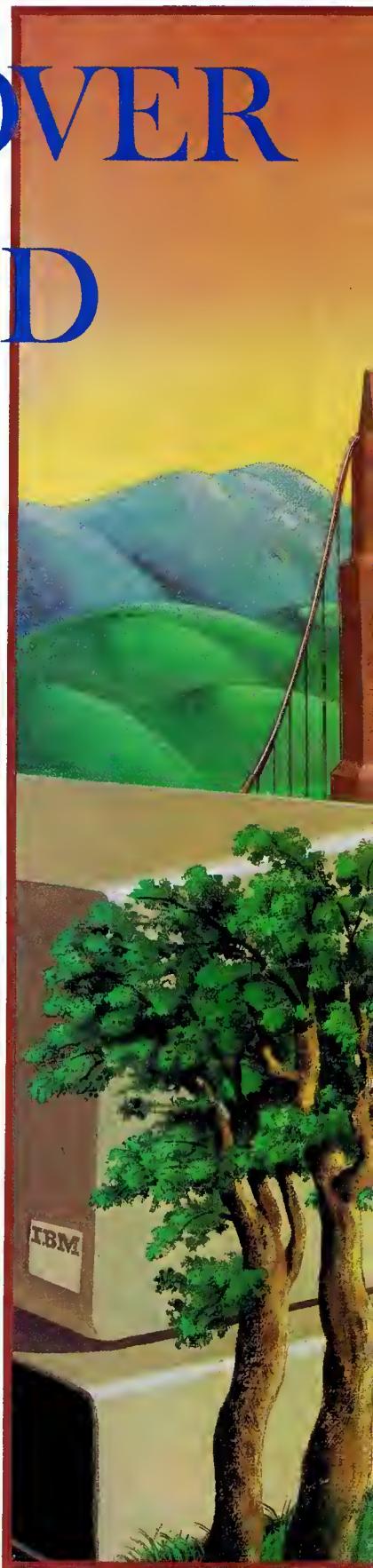
BRIDGE OVER TROUBLED WATERS

WHEN THE AMIGA 2000 was introduced in February 1987, one of the very first expansion cards announced for the new machine was the Commodore A2088 Bridgeboard. An IBM PC/XT on a board, the A2088 was heralded as the long-awaited "bridge" to Amiga-IBM PC compatibility. Skeptics (myself included) were more than a little wary—once burned, twice shy, but *twice* burned, well

After all, at the official launch of the Amiga 1000 back in July 1985, hadn't Commodore pulled from its bag of magic tricks the now-infamous Transformer software that would achieve full IBM compatibility on a disk? When that bubble burst (it worked with only a few text-oriented programs, and even then at only 25–50% of the speed of the slowest—4.77 MHz—PC), even Commodore began downplaying the Transformer software, regarding it as a "stopgap" solution to be used only until the arrival of the real PC system—which would be a hardware add-on.

The SideCar was an Amiga expansion chassis that would ▶

BY LOUIS R. WALLACE





WILL THE
A2088
BRIDGEBOARD
PROVIDE THE
CONNECTION
TO REAL
AMIGA-PC
COMPATIBILITY?

house an IBM in hardware, with a 5½" disk drive, and offer Amiga expansion slots. However, while it actually did ship in Canada and Europe, very few found their way into the U.S. Those that did were so expensive (\$995) that Commodore's promise to make the SideCar available at "substantially less than \$1000" became a standing joke—albeit a very painful one to those Amiga users who had been waiting so long for a solution. The Holy Grail of promised PC-compatibility seemed to be receding back into the mists of some high-tech Avalon.

THIRD TIME LUCKY

Skepticism aside, this time Commodore has come up with a viable way to achieve Amiga-IBM PC compatibility. We have already profiled the A2088 Bridgeboard in a technical report when it was first announced and a prototype board was made available to the magazine (see Bob Ryan's "Between Two Worlds: The A2088 Board," p. 28, in the March/April issue of *AmigaWorld*.) The Ryan article presented the basic facts about the new board and explained how it would allow two separate computers to work in one box.

Now that the A2088 is out on the market and in use on a number of Amiga 2000s, we felt that an evaluation of the actual merits of the Bridgeboard would be in order. In other words, how good a PC is it? Is it a true clone? Does it have any special features? How fast is it? Does it degrade the Amiga's native performance? Is it a viable PC system?

A2088 SPECS, INSTALLATION AND DISPLAY

The A2088 (\$699) is a 4.77 MHz PC/XT on a board. Containing 512K of RAM that is completely independent and isolated from any Amiga RAM, it also has 64K of dual port RAM for communicating information between the PC and the Amiga. It uses the Intel 8088 microprocessor, and while no 8087 math coprocessor is supplied, an empty socket for one is available. The BIOS (Basic Input/Output System) is made by Phoenix Technologies, the leading manufacturer of PC-compatible BIOS. (The BIOS was modified somewhat in order to work in the Amiga 2000 environment.) You also receive a 5½" 360K disk drive for internal mounting in the Amiga; if you wish, a second external 5½" drive may be added.

In addition to the hardware, there is a set of Amiga software tools that allows you to configure the type of screen you wish to use, as well as specialized utilities that allow a limited sharing of resources, such as disk drives, RAM and I/O ports. You also receive two PC disks, one which has DOS 3.2 and another with GWBASIC. Both disks come with extra utility programs and include manuals.

The 2000 system I used came with both the board and floppy already installed, but during the course of this evaluation I removed them both and rein-

◆ ◆ ◆ ◆ ◆

THIS TIME, COMMODORE HAS COME UP WITH A VIABLE WAY TO ACHIEVE PC COMPATIBILITY.

stalled them. The process is not difficult, but even if you have never installed a PC board or disk drive before, the manual provides you with complete, step-by-step instructions and a dozen photographs to aid you in setting up the hardware. Depending in which slot you install the Bridgeboard, you will end up with either two PC slots and four Amiga slots free, or three of each type free. These can be used for other hardware additions.

In order to use the hardware, there is a special library called Janus that must be installed on your system disk. Also needed are the PCWINDOWS, PCPREFS and PCDISK programs. To make it easy, a program is supplied to install these on your system disk.

The system uses the Amiga's graphics display system to create the IBM display, using either the monochrome text (MDA) or color graphics adapter (CGA) modes of operation. It does not support directly the now-standard EGA (Enhanced Graphics Adapter) display mode, but that can be added (see the "Hardware Expansion" section further on in this article). The IBM programs are displayed in Amiga windows, which have the normal assortment of menus and gadgets. You can use either the Workbench screen (four colors) or a custom screen (up to sixteen colors for text, four colors for graphics). The window borders can be turned on and off as desired.

You choose the number of colors to be used from the window's menus—an excellent time-saving option. The fewer colors, the faster the screen update. Even though the Amiga has blindingly fast graphics, it takes a little time for it to get the information from the PC side, convert it to bitmap (remember, there is no text mode on the Amiga, everything is graphics) and place it in the PC window. The more colors you have, the greater the number of bitplanes. The more bitplanes, the more time it takes to update the screen. The effect of this is that scrolling text in the PC window is sometimes jumpy. You can achieve best results when using four or fewer colors.

In my opinion, the four-color option is the best because the Workbench screen also uses four colors. If the PC window uses four colors, then the two can share the same screen—which means the PC can become part of the Amiga's desktop environment. I often work in interlace mode (640 × 400), and thus with this feature I can have a full-size Amiga screen and a full-size PC screen at the same time.

The default PC window is the monochrome text display. In order to change to color from the Workbench, you first type MODE CO80, then turn off the monochrome window, open the PC drawer from Workbench, select PC COLOR and open a new window, this time in CCA mode. Returning to monochrome mode involves a similar process.

I prefer to use the color window as my default, so I modified my startup sequence to run the PCWINDOWS program automatically with the color window

as default. This makes the PC always available, and it saves me time and effort when I power up. I also run the program called PCDISK from my startup sequence.

SHARING THE WEALTH

In order to share resources or transfer files, you must start PCDISK, a program on the Amiga side of the system. You can select it from the Workbench or from the CLI by using the RUN PCDISK command. Once activated, PCDISK allows you to transfer files easily between the two sides.

The GWBASIC disk also provides two very useful programs to aid in file transfer. AREAD.EXE enables you to copy an Amiga file on any Amiga drive to the PC side. AWRITE.EXE allows you to copy files from the PC to the Amiga. AWRITE even allows you to send files from the PC to Amiga devices, such as the printer or CON: window.

Another method of sharing information involves using the Amiga clipboard. Each PC window contains a menu option called edit, which allows you to use the mouse to copy and paste text within the PC display. When pasted, the text is typed to the display as if you were typing on the keyboard directly. This information is stored in the Amiga clipboard, where it can also be accessed by Amiga programs that use the clipboard, such as Notepad. Thus, using the mouse you can capture PC information and send it to the Notepad at the click of a mouse button. The reverse is also possible: You can send information from the Amiga through the clipboard and out the PC display.

Adding a hard drive to the PC side of the system is a third method of sharing resources. Although I did not check this personally (the hard drive on my PC is full), a utility on the DOS 3.2 disk should allow you to partition part of the MS-DOS hard drive in AmigaDOS format. This new drive becomes DJ0: (the J is for Janus); once formatted and mounted, it can be used by the Amiga just like any other Amiga drive. If you disregard the initial cost of the Bridgeboard, this becomes a very attractive and inexpensive method of adding a hard drive to the A2000. For example, 40MB drives for PCs are available for under \$500; partitioning such a drive at 20MB for each DOS gives you a 20MB Amiga drive for under \$250.

Another technique for sharing resources allows the PC to gain access to some of the Amiga's disk space, including the RAM disk. Because only one floppy comes with the Bridgeboard and almost all PC software requires two drives, you are almost forced to buy a second, external drive for the PC side. With PCDISK in operation, however, you can use the JLINK utility on the MS-DOS disk to create up to four virtual drives for the PC. These virtual drives can be on any Amiga disk: floppy, hard drive or RAM. Once you create them, you can access them from the PC side as drives C through F. I made one on the internal

THE BRIDGEBOARD OFFERS FLEXIBILITY FOR THE A2000 OWNER WHO NEEDS AN IBM COMPATIBLE.

Amiga hard drive, copied all the MS-DOS commands over and designated a PATH to it. This became the SYSTEM disk for the PC. I then added an autoexec.bat file to my PC boot disk that automatically activated the virtual drive C and set the PATH to C. The Bridgeboard PC then became a two-drive system.

Additionally, you can use the Amiga's parallel port as LPT1: on the PC side. When you are using it as LPT1:, however, you cannot access it from the Amiga side until you have disabled it from the PC side. You cannot use the Amiga's serial port at all from the PC side. In order to have a serial port for the Bridgeboard, you must add a PC expansion board that has one or more serial ports. The PC would then have exclusive use of these.

Finally, there is the as-yet-undemonstrated feature of the Bridgeboard that will allow properly designed software to use the 8088/8087 hardware as coprocessors for the Amiga. In this situation they would become part of the Amiga itself, just as the custom graphics and sound chips are. Specialized software is required for this, and so far none exists.

COMPATIBILITY AND PERFORMANCE

Of paramount importance in evaluating the Bridgeboard is the question of software compatibility. Exactly how PC-compatible is the Bridgeboard? While I have had neither the time nor the software resources to test every major PC program, I did use a fairly wide selection of PC software. In testing, I loaded and used Lotus 1-2-3 (spreadsheet), Condor3 (database), Microsoft Word (word processing), MathCAD (numeric analysis), QuickBasic 3.0 (BASIC compiler), TurboBasic 1.0 (BASIC compiler), Microsoft's Flight Simulator, Zork I (text adventure game), StarFlight (graphics adventure game), P (a set of graphics demos), Stargate Defender (arcade game) and several Norton Utilities. All worked as expected on a standard 4.77 MHz PC, except that screen updates were slow. This does not significantly affect the performance of most of the programs, but it does make Stargate Defender essentially unplayable. I do not expect to play any fast action games in PC mode using the Amiga PC windows.

In addition, using QuickBasic 3.0, I wrote and compiled several programs used to test the performance of various aspects of the Bridgeboard. These worked on the Bridgeboard as well as on a PC clone I used for comparison. Because the Bridgeboard uses both a standard Intel 8088 as well as Phoenix BIOS, it does achieve, as expected, a high degree of compatibility with PC software.

One of the standard methods of comparing PCs and compatibles is the Peter Norton System Index. Using some arcane reckoning known only to himself and a few disciples, Norton compares the prospective clone against a standard PC, XT or AT. When I used this index to test the Bridgeboard, it gave a value of 1.0, ►

meaning it was exactly comparable to a standard XT.

Not that I don't trust Peter Norton, but I wanted to run a few tests myself. I used three programs as benchmarks. One tested the speed of disk access, writing 10,000 words to a file and then reading them back. The second performed 10,000 integer multiplications, while the last—the Savage floating-point benchmark—tested the speed of the floating-point operations. The individual results are given in the chart below. None of these operations accessed the screen, so that was not being tested.

The PC used as a comparison was a switchable turbo model, running at either 4.77 or 8 MHz and equipped with a V20 chip, making it about 10% faster than it would have been using the standard Intel chip. It also was equipped with an Intel 8087 math chip, so the Savage results would have been in the turbo clone's favor no matter what. Nevertheless, the three programs indicate you will get a performance somewhat less than a standard PC at 4.77 MHz. With allowances for the V20 and math chip, I estimate about an 85-90% performance rating when compared to a plain vanilla 4.77 MHz machine.

Test	PC 4.77	PC 8	Bridge A:	C:	D:
R/W	118.0	89.0	147.0	105	95
INT Mult	5.4	3.1	6.4		
Savage FLOAT	128.4	74.4	174.8		

Note: All times in seconds. Drive C: was a virtual drive on DH0; while drive D: was a virtual drive on RAM.

HARDWARE EXPANSION

Depending in which slot you install the Bridgeboard, you will have either two or three additional PC slots available to accommodate a variety of PC add-on cards—hard drives, hard cards, graphic cards such as EGA, internal modems, multifunction cards that give additional RAM and/or I/O ports, local area networks and so forth.

I tried two different experiments to get a flavor for Bridgeboard expansion. In one I installed a Paradise EGA card in the A2000 and hooked up a Samsung dual frequency EGA monitor. While the Bridgeboard was still sending information to the PC window on the Amiga display, it was also sending it to the EGA system—with no delays. It looked very good and seemed to work without problems. The Norton System Index program recognized the EGA card was in place, and programs designed to work in EGA mode functioned properly. I resized the PC window on the Amiga to postage-stamp size and moved it out of the way. When I wanted to access the Amiga, I would click in the Amiga windows, and when I wanted to use the PC mode I would click in the postage-stamp window and activate the PC.

The second experiment was more complex and

THE ONLY NEGATIVE ASPECTS ARE THE SLOW SCREEN UPDATES AND THE PRICE.

ambitious. Because there are add-on boards that turn XT's into ATs (as well as ATs into 80386 machines), I thought it would be interesting to see if the XT in the Bridgeboard could be transformed into an AT. Commodore has indicated an AT-style 80286 Bridgeboard would be released at a future date, but perhaps it would be possible to achieve the AT transformation with the existing Bridgeboard.

For the test I used a 12 MHz 80286 accelerator from Micro Way equipped with an 80287 math chip. I removed the 8088 from the Bridgeboard, inserted a cable into the 8088's socket, put the Bridgeboards' 8088 onto the Micro Way board and put that board in one of the PC slots. Theoretically, I should then have had a 12 MHz AT. The only problem was I got a "bad boot disk" error on the PC side when I powered up. I checked all the connections and tried again—with the same results. I took everything back apart, restored it to its original state and turned on the Bridgeboard; it worked just as before, so the problem did not lie there. Because I had borrowed the 80286 board, I did not spend any more time trying to make it work. Also, I had heard that other PC clone users had gotten the same "bad boot" error with this board. Thus, I still feel that the AT transformation can be done, perhaps with a different 80286 board.

Another Bridgeboard upgrade route may lie with using a 68020/68881 board, such as the 14 MHz Turbo Amiga board from CSA. (See Bob Ryan's article "Turbocharging Your Amiga 2000" in this issue, p. 26.)

CAN YOU GET TO THE OTHER SIDE?

There can be no doubt that, for the A2000 at least, IBM compatibility has arrived. The Bridgeboard is a very compatible clone and uses most PC software and hardware properly. It offers quite a bit of flexibility for the A2000 owner who needs an IBM compatible, yet does not want to sacrifice the power and versatility of the Amiga.

The only negative aspects are the slow screen updates and the price of the Bridgeboard itself. For \$700 on today's market, you can get a two-drive, 640K turbo XT complete with monitor and monochrome graphics. Yet, considering that hard drives for the Amiga are still in the \$1,000 range, the Bridgeboard offers you a hard drive and PC clone for the Amiga at about the same price. And, as it seems that hardware prices are like leaves in autumn, we can reasonably expect to see them fall in due course. Overall, however, the Commodore A2088 Bridgeboard is the first serious answer to Amiga-IBM PC compatibility we have seen. ■

Louis R. Wallace is a Contributing Editor to AmigaWorld and Technical Manager of RUN. Write to him c/o AmigaWorld, Editorial Dept., 80 Elm St., Peterborough, NH 03458.



AT LAST!

***...real-time, LIVE! video on your
Amiga's screen.***

- ***True Color:*** just as it comes from your video source: camera, VCR, TV, anything. Direct, moving, in your Amiga's memory...our patented technology.
- ***Fast:*** video images in black & white, 32-color, and 4,096-color HAM. See 15 new images every second in black & white, 12 in color, 4 in HAM.
- ***Save:*** moving video, play it back, use it in other programs. Unlimited stills, too.
- ***Video Effects:*** real-time mouse-controlled...posterization, fades, color-keying, strobes, more.
- ***Roll Your Own:*** programmer's video library, hardware documentation, examples in C, Basic.
- **\$295.** Immediate delivery. This is hot.

To order call toll-free anytime:
Nationwide: 800-452-4445, ext. 1156
California: 800-626-9541, ext. 1156

For more information, contact:

a²

A-Squared Distributions Inc.

6114 La Salle Avenue, Suite 326
Oakland, California 94611
415-339-0339

TURBOCHARGING YOUR AMIGA 2000

In combination with a 32-bit memory board, the CSA 68020 CPU Board will let your Amiga burn rubber. Just be prepared for "sticker shock."

By Bob Ryan

There's no denying the Amiga 2000 is a mean machine. With a 16/32-bit Motorola 68000 engine, overhead cam custom chips, 25 fuel-injected DMA lines and a megabyte of high-octane RAM, it blows the doors off of any other microcomputer in its class. But for some applications, especially big-time number crunching, even the A2000 can use a boost. Right now, there's no better boost available than the 68020 CPU Board from Computer System Associates. With its 14.32 MHz MC68020 microprocessor and MC68881 math coprocessor, CSA's board lets you power your Amiga to higher performance.

The 68020 is the big brother of the 68000. It is a true 32-bit processor, with 32-bit registers, a 32-bit address bus and a true 32-bit data bus. In comparison, the 68000 has 32-bit registers but only a 24-bit address bus and a 16-bit data bus. The 68020 is designed to execute the same instructions as the 68000 (one notable exception is listed below); thus, software written for the 68000 should work with the 68020. Because the 68020 can use much higher clock rates and fetch 32 bits of information at a time, it should theoretically outperform the 68000 by a factor of at least 4.

The 68881 is dedicated to performing mathematical functions very quickly. Both the 68000 and the 68020 can perform only basic math functions, while most floating-point math is done by software. The 68881 performs floating-point math in hardware—at speeds much faster than software.

The CSA 68020 CPU Board is designed to let the Amiga 2000 take advantage of the power of these two

chips. The results you get from the board depend in large part on the applications you run.

DROP IT IN...LET IT RUN

The 68020 CPU Board fits into the Amiga 2000's CPU slot—the 86-pin slot Commodore provided for co-processor boards. Boards in the CPU slot have the same level of access to the system bus as does the 68000; thus, they can take over the operation of the Amiga. To install the board, unplug the machine and remove the five screws that keep the case attached and slide it off. The CPU slot is the first slot on the left (discounting the video slot in the left rear). After touching a grounded component such as the power supply, you simply nudge the board into the slot.

If your Amiga 2000 has a revision 4.2 motherboard, it changes the CPU slot slightly and you will have to cut a trace and install a jumper on the motherboard to get the CSA board to work. Revision 3.9 works without any problems. (The revision number is located at the front-right corner of the motherboard.)

Once you have placed the board into the CPU slot, physical installation is complete. No special software installation is required. You boot the system normally with Workbench.

The CSA board will shut out the 68000 and take over the system. The board has a timing clock that runs at 14.32MHz—twice as fast as the 7.16MHz clock that drives the 68000. Thus, operations run twice as fast inside the 68020 as they do inside the 68000. When addressing Amiga memory or the custom chips, however, the 68020 gets throttled back to 7.16MHz ▶



because the rest of the Amiga system is designed to work at this rate. The 68020 is, in effect, emulating the Amiga's 68000. The 68881 always runs at 14.32MHz, however, because it communicates solely with the 68020.

To test the efficiency of this setup, I ran the Dhrystone benchmark from the first Fred Fish disk. I was surprised to find that, according to the benchmark, the 68020 board performed at only 86% of the speed of the 68000! A call to CSA revealed the problem: The 68020 naturally generates 32-bit addresses and expects data in 32-bit chunks. It takes additional time for the processor to generate a 24-bit 68000 address to access the 16-bit memory of the Amiga. Thus, for many operations, the 68020 will actually degrade the performance of the Amiga slightly.

If that is the case, then why in the world would you want to put the CSA board into your computer? The answer lies with the 68881 chip. For software that supports it, this chip makes a world of difference. For example, I received recently the latest version of Sculpt 3D, the ray-tracing graphics program from Byte by Byte, which supports the 68881 chip. Sculpt 3D uses thousands of floating-point operations to produce the most startling graphics available on the Amiga. The problem is that it can take hours—and sometimes days—to render one image.

To test the performance benefit of the 68881 chip, I did two renderings of the coffee cup picture available as an example on the Sculpt 3D disk. I changed the standard settings to maximize the amount of floating-point operations while minimizing the amount of time I would have to stare at a stopwatch. (For Sculpt 3D users, I set Mode to Photo, Interlace; Anti-aliasing to Best; and size to Tiny.) Without the 68020 CPU Board, it took Sculpt 3D 999 seconds to render the image; with the board installed, it took 256 seconds—a four-fold increase in speed. Clearly,

the 68020 CPU Board makes Sculpt 3D a lot more efficient.

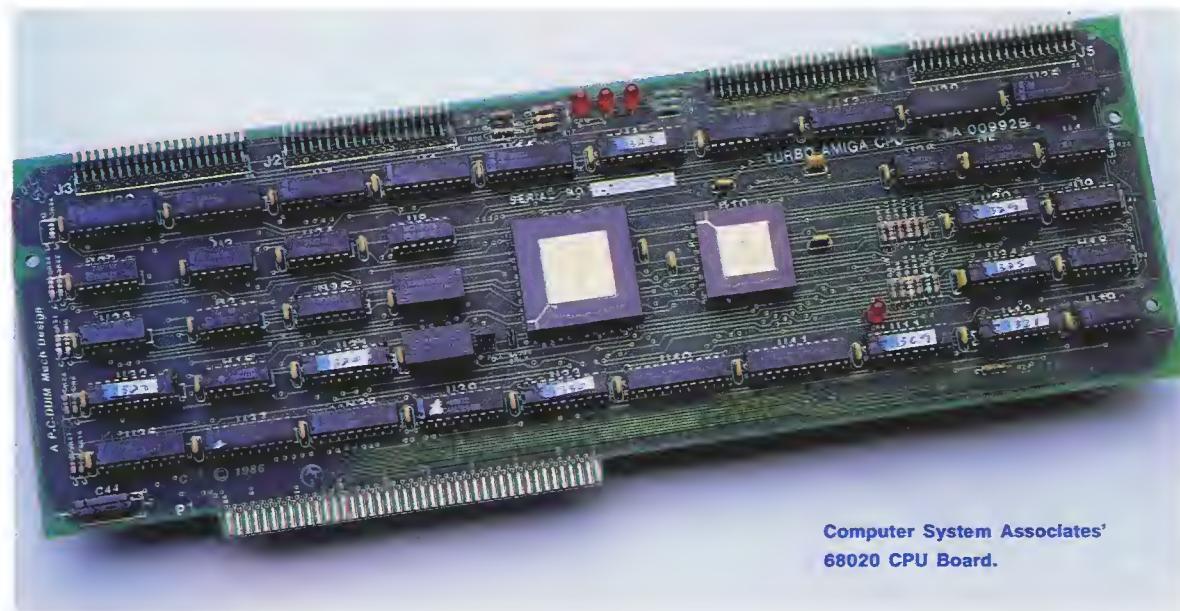
BUT . . . MORE HORSEPOWER REQUIRED

Of course, you may not be willing to sacrifice 15% of your computing power just to run those few programs that support the 68881. Ideally, you would like to take full advantage of the 68020 running at 14.32MHz, but the bottleneck at the interface between the Amiga bus and the CSA board prevents that. To eliminate it and to get the 68020 running at full speed, CSA produces a special 32-bit memory board for use in conjunction with the 68020.

I installed the board into an expansion slot in the A2000. It's not a normal Zorro board; instead of transmitting data via the Zorro bus, it attaches directly to the 68020 CPU board via four ribbon cables. Ribbon cables create a 32-bit bus that lets the 68020 access the memory on the board at 14.32 MHz— bypassing the bottleneck described above.

Because the 32-bit memory on the board lies outside the address range of the 68000, it can be accessed only by the 68020. To get AmigaDOS to recognize the existence of the memory (and consequently to load programs and data into it), you have to run a program (addmem) from your startup-sequence file. Although addmem can cause conflicts with auto-config devices, here there are no problems because the memory does not reside in the 8MB auto-config address range.

Once I installed the board and ran addmen, I ran the Dhrystone benchmark again. This time, the combination of the 68020 CPU Board and the 32-bit memory board outperformed a bare-bones Amiga 2000 by a factor of 2.8. I then used Sculpt 3D to render the coffee cup in 127 seconds, nearly eight times faster than with a standard Amiga. Clearly, the way to really improve the overall performance of ▶



Computer System Associates'
68020 CPU Board.

And the hits keep on coming.

At WordPerfect Corporation, having one blockbuster hit just isn't enough. That's why we're not resting on the success of WordPerfect, the top-selling word processor for the IBM® PC. Instead, we keep turning out hit after hit.

The latest WordPerfect entry on the software charts introduces Commodore Amiga® users to power word processing. Unlike other Amiga word processors, WordPerfect for the Amiga easily performs functions like table of contents generation, footnoting,

on-screen columns, macros and much more. And WordPerfect for the Amiga shares document compatibility with WordPerfect files generated on many other machines, including IBM PC/compatibles, Macintosh®, Apple IIe/IIc/IIgs®, and some minicomputers.

Start your Amiga writing perfectly today, with WordPerfect. For more information, call or write WordPerfect Corporation, 288 West Center Street, Orem, Utah 84057, (801) 225-5000.

WordPerfect
CORPORATION

WordPerfect for the IBM PC/Compatibles	Number 1 on Charts
WordPerfect for Data General Minicomputer	Number 1 on Charts
WordPerfect for PC Networks	Number 1 on Charts
WordPerfect for 12 Foreign Languages	Number 1 on Charts
PlanPerfect for the IBM PC/Compatibles	Current Hit
PlanPerfect for Data General Minicomputers	Current Hit
WordPerfect for the Apple IIe/IIc	Current Hit
PlanPerfect for PC Networks	Current Hit
WordPerfect Library for the IBM PC/Compatibles	Top 20 Hit
WordPerfect for the Apple IIGS	Current Hit
WordPerfect Library for Data General Minicomputers	Top 10 Hit
WordPerfect for DEC VAX Minicomputers	Top 10 Hit
WordPerfect Library for DEC VAX Minicomputers	Top 10 Hit
Repeat Performance for the IBM PC/Compatibles	Climbing the Charts
WordPerfect Executive for the IBM PC/Compatibles	Climbing the Charts
WordPerfect for Amiga	New Release
WordPerfect for the Atari ST	New Release
WordPerfect for the Apple Macintosh	Release: 10/87
DataPerfect for the IBM PC/Compatibles	Release: 11/87
WordPerfect for UNIX	Under Development
WordPerfect for IBM Mainframes	Under Development

your Amiga 2000 is to use the 68020/68881 board in conjunction with 32-bit memory.

WHAT ABOUT ENGINE KNOCK?

Granted you now have a lot of power under the hood—but let's see if you're just spinning your wheels a lot faster. To test software compatibility, I ran several dozen popular programs with the 68020/68881 board and found that they all worked. On the graphics side, Sculpt 3D, VideoScape 3D, DeluxePaint II, DigiPaint and Aegis Images all worked well. I also used WordPerfect, ProWrite, MaxiPlan Plus, PageSetter, CityDesk and a few other productivity packages; again all worked without difficulty. In general, if developers follow Commodore's guidelines (always generate 32-bit addresses and avoid the MOVE SR,<ea> instruction), software that runs on the 68000 will run on the 68020. Incompatible software, however, undoubtedly exists, and it is advisable to ask specifically about your application before you buy one of these boards.

The most important piece of software I found that would not run with the 68020 is Amiga Basic. Apparently, the folks at Microsoft wrote Amiga Basic to generate 24-bit addresses—which are insufficient for the 68020.

Many high-level languages now offer support for the 68020 and the 68881. Manx C and Abssoft Fortran support both chips. According to sources at Commodore, the next release of AmigaDOS will contain a 68881 library that will increase greatly the number of software titles that take advantage of the 68881. The library will emulate the 68881 in software, freeing programmers from having to write two versions (one supporting the 68881, the other not) of the same software. If a program uses the 68881 library, the math routines will execute in hardware if the 68881

is present, and in software if it is not.

In terms of hardware compatibility, as of this writing there are not very many boards available for the Amiga 2000, making testing comparatively easy. The 68020/68881 board in conjunction with the 32-bit memory board worked well with the Commodore A2052 2MB RAM Board and with the A2088 Bridgeboard. The 68020/68881 board, however, did not enhance the performance of the Bridgeboard in any significant way. (See "Bridge Over Troubled Waters," p. 20 in this issue of *AmigaWorld*, for an evaluation of the A2088 board.)

My biggest disappointment came when I discovered that the 68020 CPU Board did not work with the Commodore A2090 Hard Disk Controller. Although CSA makes a SCSI interface and drive for the system, I have no intention of throwing out my current hard-disk system. At press time, neither Commodore nor CSA could explain why the two boards were incompatible.

ROAD TEST RESULTS

The basic design of the Amiga is quite intricate and sophisticated, and the operation of the custom chips is highly dependent upon precise timing. Thus, you cannot speed up an Amiga the same way you can an IBM PC or an Apple II by simply adding a card with a faster processor—the current crop of custom chips can only operate at 7.16MHz. Don't expect the CSA 68020 CPU Board to speed up your Amiga under normal circumstances—it won't. If your software does not support the 68881 chip, the board alone will actually degrade the performance of your system. To achieve an increase in performance of 2.5 to 3 times that of a standard Amiga 2000, you must also buy at least 512K of 32-bit memory. (You can increase performance further by buying even more 32-bit memory.) Thus, turbocharging your Amiga will set you back at least \$2,800.

Of course, if you need 68881 support—for instance, if you are using Sculpt 3D to produce professional-quality video images—then the \$1,500 68020/68881 board may be worth the savings in time. On full-screen Sculpt 3D renderings, the 68881 can increase performance by a factor of 10 without using a 32-bit memory board. Also, universities and research institutions that have the resources to write custom applications employing the 68881 can get a lot of mileage out of the CSA board. For average users, however, the CSA 68020/68881 board will not be of practical value until support for the 68881 is more widespread.

The CSA 68020 CPU Board is an expensive product that will, with specific applications, greatly increase the speed of your Amiga 2000. With some 32-bit memory, it will increase the speed of any Amiga application. The board is well built and well supported. It is not for the casual user, but it is a good solution for those who use the Amiga in serious graphics and number-crunching applications. ■

PRODUCT INFORMATION

CSA 68020 CPU Board

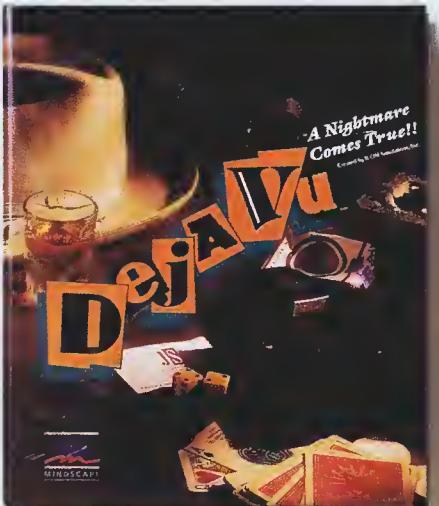
14.32MHz MC68020 microprocessor
and MC68881 math coprocessor
\$1,495
Version with 20MHz MC68881 costs \$1,895

CSA 32-Bit Memory Board

512K of 32-bit static RAM
\$1,295
2MB version costs \$3,995

Computer System Associates

7564 Trade Street
San Diego, CA 92121
619/566-3911



AWARD-WINNING
INTERACTIVE
GRAPHIC
INVOLVING
MYSTERIOUS
CHALLENGING
POWERFUL
BOGLLING

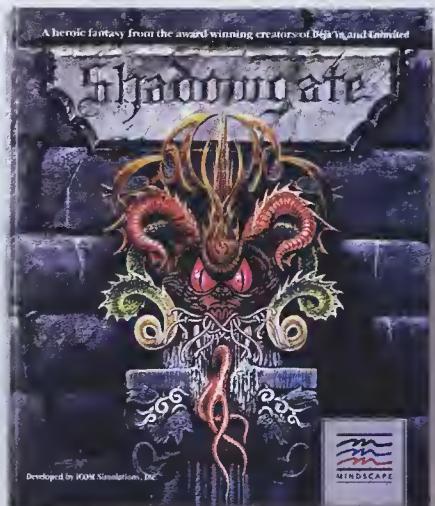
Uninvited.



Developed by ICOM Simulations, Inc.



AWARD-WINNING
INTERACTIVE
GRAPHIC
INVOLVING
MYSTERIOUS
CHALLENGING
POWERFUL
BOGLLING
ANIMATED
GHASTLY
HAUNTING
SPOOKY
DEADLY
GRIPPING



NEW
INTERACTIVE
GRAPHIC
INVOLVING
MYSTERIOUS
CHALLENGING
POWERFUL
BOGLLING
ANIMATED
GHASTLY
HAUNTING
SPOOKY
DEADLY
GRIPPING
HORRIFYING
GORY
UNCANNY
DIABOLICAL
PETRIFYING
MANIACAL
AWESOME

AWARD-WINNING GAMES NOW AVAILABLE ON AMIGA™

In 1986, *Deja Vu*™ was named Graphic Game of the Year by *Family Computing* and elected to Steven Levy's "Game Hall of Fame" in *MacWorld*.

Uninvited™ was chosen Entertainment Product of the Year in '86 by *MacUser* and also named Best Macintosh™ Game by *Omni*.

The best is yet to come.
Presenting *Shadowgate*™.

Mindscape's new way to give thrill-seekers the willies.

In *Shadowgate*, as the last in an ancient line of Kings, only you can destroy the evil warlock and thwart his plans to raise the titan Behemoth.

Up for a little one-on-one with some dragons, demons, trolls, and monsters? Just bring along your courage. The mayhem is on the house.

Mindscape
Software that challenges the mind.



Visit your retailer or call 1-800-221-9884 for VISA or MasterCard orders. To purchase by mail, send VISA or MasterCard number with expiration date, check or money order for \$49.95 plus \$3.00 for shipping and handling for each title ordered to Mindscape, Inc., P.O. Box 1167, Northbrook, IL 60065. Allow 3-5 weeks for delivery. Lawyers will enjoy this: © 1987 Mindscape, Inc. Mindscape is a trademark of Mindscape, Inc.

Software copyright © 1985, 1986, and 1987 ICOM Simulations. Macintosh is a trademark of Apple Computer, Inc. Amiga™ is a trademark of Commodore Amiga, Inc.

When you want to talk Amiga

COMPUTERS



AMIGA 500 SYSTEM

Includes:

- Amiga 500 Computer
- 1 Megabyte RAM
- 1080 Color Monitor
- Amiga Mouse
- Amiga DOS

Call for best price!

**WE STOCK THE ENTIRE LINE
OF AMIGA PRODUCTS!**

DISK DRIVES

COMMODORE AMIGA

Amiga 1010 3½" External.....\$219.00
Amiga 1020 5¼" External.....189.00
Amiga 2010 3½" Internal.....179.00

C. LTD

20 MB.....899.00
33 MB.....999.00
44 MB.....1199.00
50 MB.....1249.00

MINISCRIBE

20 MB 3½" 40 MS.....349.00
20 MB 3½" 65 MS.....319.00

SEAGATE

30 MB ST238.....389.00

SUPRA

20 MB.....759.00
30 MB.....879.00
60 MB.....1599.00

XEBC

97204 20 MB.....799.00

MONITORS

AMDEK		
410 A/W/G.....	\$169.00	
Color 600 Hi-Res RGB.....	349.00	
AMIGA		
2080 Hi-Res RGB.....	Call	
AMIGA 2002 Hi-Res RGB Color.....	309.00	
MAGNAVOX		
502 Composite Color.....	189.00	
8562 RGB/Composite.....	279.00	
NEC		
1402 Multisync.....	599.00	
SONY		
1302 Multiscan.....	649.00	
1310 RGB/Analog.....	339.00	

MODEMS

AMIGA		
Amiga 1680.....	149.00	



ANCHOR OMEGA 80	\$119	
------------------------	--------------	--

Volksmodem 12 300/1200.....	99.99	
Signalman Express 1200 Ext.....	199.00	
Omega 80.....	119.00	
HAYES		
Smartmodem 300.....	139.00	
Smartmodem 1200.....	299.00	
Smartmodem 2400.....	459.00	

NOVATION		
Parrot 1200.....	119.00	
PRACTICAL PERIPHERALS		

1200 External.....	139.00	
--------------------	--------	--

DISKETTES

MAXELL		
MD2-DM DS/DD 5½".....	9.49	
MFD2-DDM DS/DD 3½".....	19.49	
SONY		
MD2D DS/DD 5½".....	9.49	
MFD-2DD DS/DD 3½".....	19.99	

PRINTERS

BROTHER		
HR20 22 cps.....	\$369.00	
EPSON		
FX86E.....	329.00	
EX1000.....	489.00	
EX800.....	389.00	
LQ800.....	459.00	
LQ1000 Color.....	569.00	
OKIDATA		
Okimate 20 Color.....	129.00	
ML182 - 120 cps.....	249.00	
ML292 - 200 cps 80 Col.....	469.00	



PANASONIC 1091i
160 cps Dot matrix **\$189**

STAR MICRONICS		
NX10 120 cps.....	159.00	
NR15 - 240 /60 NLQ.....	589.00	
NX15 - 120 cps/30 NLQ.....	359.00	
NB15 - 100/300 cps 24 wire.....	949.00	

ACCESSORIES

ACCESS ASSOCIATES

Alegra 2 MB.....529.00
Alegra 512K.....259.00
Auto Pal Expander Kit.....29.99

AMIGA

501 Amiga 500 512K Exp.....169.00
2052 RAM Expansion (2MB).....399.00
2088 Bridgeboard w/5¼" Drive.....599.00
2090 Hard Drive Controller.....349.00
1300 Genlock (1000 Only).....239.00

C.LTD

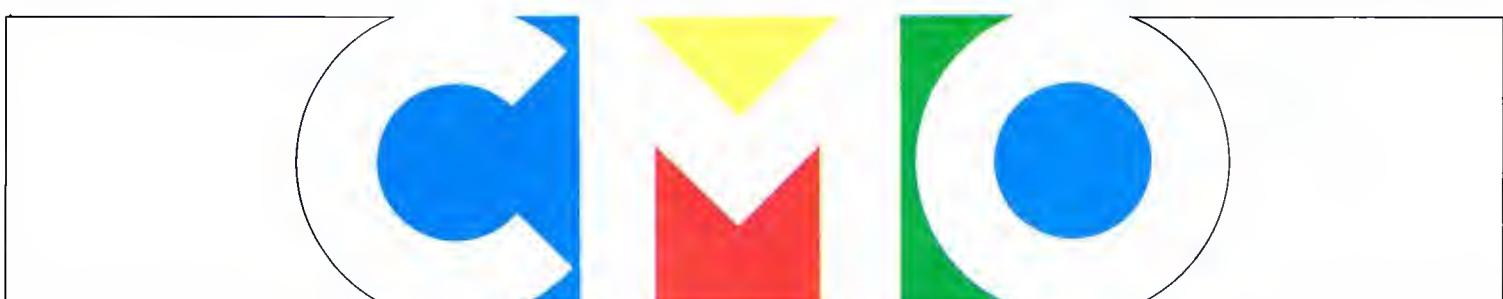
Amega w/OK.....249.00

CABLES

Amiga to Sony 1302.....16.99
Amiga 1000 Parallel Printer Cable.....19.99
Amiga 500,2000 Parallel Printer Cable.....19.99

PACIFIC PERIPHERALS

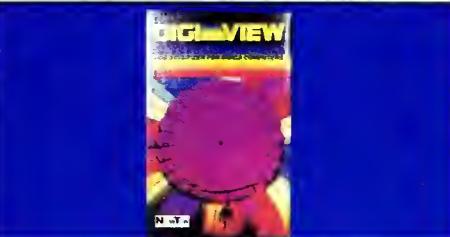
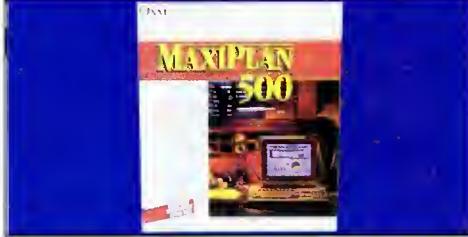
Cage II OK.....249.00
Cage II 2 MB.....469.00
Cage II 4 MB.....859.00



COMPUTER MAIL ORDER

Circle 41 on Reader Service card.

..... you want to talk to us.

SOFTWARE	SOFTWARE	SOFTWARE
AB SOFT A/C Basic.....\$139.00 A/C Fortran.....199.00	EPYX Rogue.....\$24.99 Summer Games.....24.99 World Games.....24.99	MICRO SYSTEMS Analyze.....\$66.99 Scribble.....66.99 On-Line.....46.99
ACCESS SOFTWARE Leader Board.....26.99 10th Frame.....27.99	EQUAL PLUS Financial Plus.....189.00	MIMETICS Audio Digitizer.....89.99 Midi Interface.....44.99 Soundscape.....129.00
ACS Station Manager.....749.00 Grade Manager.....69.99 Quiz Master.....64.99	FUTURE WORKS Lexcheck.....39.99	MINDSCAPE Halley Project.....34.99 Keyboard Cadet.....29.99 SAT Prep.....51.99
ACTIVISION Gamestar Basketball.....28.99 Gamestar Baseball.....28.99 Gamestar Football.....28.99 Gamestar Golf.....28.99 Hacker.....28.99 Music Studio.....37.99	GOLD DISK Gold Spell.....34.99 Laser Script.....34.99 Page Setter.....91.99	NEW HORIZONS Flow.....69.99 Pro Write.....79.99
AEGIS DEVELOPMENT Animator/Images.....83.99 Draw Plus.....149.00 Impact.....53.99 Diga.....54.99 Sonix.....49.99	INFINITY Galileo.....59.99 Shakesphere.....169.99	NEWTEC Digi-View.....139.00 Digi-Paint.....47.99
		
NEWTEC Digi-View 2.0 \$139	OXXI SOFTWARE MAXIPLAN 500 \$99.99	WORD PERFECT \$199
ANAKIN RESEARCH Easyl.....369.00	OXXI Maxiplan 500.....99.99 Maxiplan Plus.....134.00	WORD PERFECT INC. ZIRKONICS Professional Text Engine.....79.99
BROWN WAGH TV Text.....68.99 Zuma Fonts (ea.).....24.99	METACOMCO Macro Assembler.....66.99 Amiga Shell.....49.99 MCC Pascal.....66.99 Cambridge Lisp.....139.00 Amiga Tool Kit.....34.99	
DELTA RESEARCH J-Forth.....87.99	MICROILLUSIONS Dynamic Cad.....369.00 Discovery.....29.99	
DISCOVERY Grabbit.....23.99 Marauder II.....26.99		
ELECTRONIC ARTS Archon II.....24.99 Deluxe Music.....62.99 Deluxe Paint II.....97.99 Deluxe Print.....74.99 Deluxe Video 1.2.....97.99 Earl Weaver Baseball.....36.99 Intellitype.....34.99 Sky Fox.....25.99		

In the U.S.A. and in Canada

Call toll-free: 1-800-233-8950

Outside the U.S.A. call 717-327-9575, Telex 5106017898, Fax 717-327-1217

Educational, Governmental and Corporate Organizations call toll-free 1-800-221-4283

CMO. 477 East Third Street, Dept. B9, Williamsport, PA 17701

ALL MAJOR CREDIT CARDS ACCEPTED.

POLICY: Add 3% (minimum \$7.00) shipping and handling. Larger shipments may require additional charges. Personal and company checks require 3 weeks to clear. For faster delivery use your credit card or send cashier's check or bank money order. Pennsylvania residents add 6% sales tax. All prices are U.S.A. prices and are subject to change and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be replaced or repaired at our discretion within the terms and limits of the manufacturer's warranty. We cannot guarantee compatibility. All sales are final and returned shipments are subject to a restocking fee.

YOU CAN'T GET THERE FROM HERE

*It's a rocky road on the upgrade
path from C-64 to Amiga.*

By Guy Wright

UPGRADING FROM ONE COMPUTER system to another is a bit like traveling in Maine or New Hampshire: Somewhere along the way you'll be told "you can't get 'theyah' from 'heah'". There is always something that won't work. Usually the software is incompatible or the peripherals can't be plugged into the new ports. There is no such thing as an all-encompassing standard in the computer industry. It is also inevitable that if you buy a particular computer today, it will be superseded tomorrow by something better. By that time you have spent a lot of money on software and peripherals that are not going to work on the newer model.



Let's say that you bought a C-64 or C-128 a while ago and you have been thinking about upgrading to a new Amiga. You have a choice: You can either stick with the old C-64 and grimace every time they come out with something super for the Amiga, or you can throw away your old system, software and peripherals and start over again from scratch. Neither idea is particularly appealing.

But wait, you have heard that there are software emulators and other devices that will let you use some of the old C-64 peripherals on the Amiga! A perfect solution. Just sell the old C-64 (or give it to your niece for Christmas), buy a new Amiga, a C-64 software

emulator and one of those cables that lets you use your old disk drive, monitor and printer. What could be easier? Camels through the eyes of needles?

Another scenario of the same flavor: You don't know where the people at the user group get their money for memory, hard disks, external drives and every software package that comes along, but *you* have to work for your money. It seems like you are the only person on the planet who has a straight-from-the-box basic Amiga setup and only a few programs. If only the Amiga software was as cheap as some of that C-64 software. A software emulator, however, would cost only about as much as one Amiga pro ►

THE ONLY DEVICE THAT WILL GIVE YOU 100% C-64 COMPATIBIL- ITY IS A C-64. PERIOD.

gram, and if you could save \$30 to \$100 on a handful of programs, then it would pay for itself in no time!

Yet another scenario: You bought a C-64 a few years ago and built a pretty respectable software library. The C-64 was what got you interested in computers in the first place and has been a trusted friend. When the Amiga came out you thought about it for a while, decided it was never going to be an easy decision, gritted your teeth and bought one. Yet, you could not quite give up the old 64. Now you have both machines set up next to each other, fighting for precious desk space. You like using the Amiga but you have a lot of files in C-64 format, a lot of BASIC programs you wrote for the 64, a lot of 64 public domain programs, a lot of games for the 64, a lot of word processing documents done on the 64, a lot of . . . well, you get the idea. If you bought an emulator, maybe you could transfer a lot of those programs and documents over to the Amiga . . . maybe use your favorite 64 word processor . . . maybe even play some of those 64 games on the Amiga . . . maybe . . .

It seems like emulators might be the answer for each of these problems, but before you rush out and buy anything, there are a few things that you ought to know.

First, the *only* emulator or device that will give you 100% C-64 or C-128 compatibility is a C-64 or C-128. Period. Second, the initial cost of the emulator might not be the total cost. Third, even if you can get a particular C-64 program to load and run on your Amiga, do not expect it to perform the same as it does on the C-64. The odds are that it will be painfully slow. Fourth, not all of these products work on all of the Amigas.

With those things in mind, let's take a look at four products available now that, to one degree or another, let you upgrade from the C-64/C-128 systems to Amiga systems.

C-VIEW: CAN DO

First, and probably the most reasonable upgrade device, is C-View from C Ltd. C-View is an adapter cable that changes the RGB output from an Amiga into chroma/luma output compatible with the Commodore 1702 monitor. It gives you a good quality image and a usable 80-column display on a 1702. C-View retails at \$49.95 and if you already own a 1702 (or 1701 or compatible monitor that requires chroma and luma input), you will not have to spend \$400 for the Amiga 1080 monitor. The picture you will get on a 1702 is not quite as good as on a 1080, but it is close enough so that you may decide you will never need one.

Short, sweet and to the point. The C-View works well at a good price.

ACCESS-64: NO LESS, NO MORE

The next upgrade path you might consider is the Access-64 device from Dynamic Software Technologies (and marketed by Progressive Peripherals). Access-64 lets you use 64 and 128 peripherals (specifically, the 1541, 1571 or 1581 disk drives and Commodore 64/128 serial printers) as if they were Amiga peripherals.

Access-64 attaches to the parallel port and will drive up to four devices (three disk drives and a printer). It uses the Mount command to link with the Amiga operating system and is fully Workbench-compatible (creates icons). Access-64 also loads a "Turbo-disk" program into the 1541/1571/1581 disk drives to speed up their operations.

Access-64 performs a number of functions that could be of value to a 64/128 owner wishing to upgrade to an Amiga 500. First, there are utilities for transferring files from a 64- or 128-formatted disk to the Amiga and vice versa. Practically speaking, this means you can get PET ASCII, ASCII or sequential files off a 64/128 disk and into your A500. Another utility program translates PET ASCII (not true ASCII) into pure ASCII so that the files can be read by most of the word processors and text editors available for the Amiga 500. Thus, if you have a lot of documents written with EasyScript or PaperClip, or any other C-64/C-128 word processor that can save documents in ASCII format (which most of them can), you will be able to transfer those documents over to the Amiga where you can read them with Texcraft or WordPerfect, LPD or ED, or any other Amiga word processor that reads ASCII (most of them can). You should also be able to transfer Amiga-generated ASCII files onto a 64/128-formatted disk so that they can be read by a 64/128-based word processor or text editor. Access-64, however, cannot translate from true ASCII into PET ASCII—only the other way around.

Another function of Access-64 is to let you use 1541/1571/1581 disk drives as if they were external Amiga drives. The Workbench disk that comes with Access-64 mounts the drive or drives so AmigaDOS sees them as DF8:, DF9:, and DF10: (if you have three drives connected in a daisy-chain fashion). But they are not true Amiga drives! A 1541/1571/1581 will only hold 170K per disk. The 1581, even though it is a 3.5" drive, *cannot* read Amiga disks.

If you want to use the 1541/1571/1581 drives as Amiga external drives, you must first "hard format" them, using a utility supplied with Access-64. This takes about a minute and thirty-five seconds. Then

ACCESS-64

PERFORMS

AS

ADVERTISED,

BUT IT IS

NOT

A SOFTWARE

EMULATOR.

you must initialize the disk from Workbench, which takes about twelve minutes and fifteen seconds or longer. (By way of comparison, it takes an Amiga drive just under two minutes to initialize a disk with eighty cylinders. The I541/I571 use only thirty cylinders, the I581 can use up to 79 cylinders but takes a *long* time to format. That makes the Amiga drives about three times faster than the 64/128 drives.) This speed reduction is going to surface any time you access the 1541/I571/I581 drives.

Another feature of the Access-64 device allows you to use a CBM serial printer on the Amiga—although, currently, there is no graphics dump capability. You can only send straight ASCII files to a C-64/C-128 printer. These printers have never been renowned for their performance or graphics abilities, but if you already have one, at least you could print things while saving up for a better printer.

Dynamic Software Technologies does not claim that Access-64 is an emulator. It is a device that lets you get information back and forth between an Amiga 500 and a C-64/C-128 disk drive or printer. Utilities that come with the device perform their tasks well (even if the tasks are somewhat limited). If you know what to expect, then Access-64 does an excellent job. It is very simple to hook up, and the integration of C-64/C-128 devices into Workbench is very smooth. If you just want to use a I541/I571/I581 as another external Amiga drive for storage, you can get all the instruction you need from a page or two of documentation. Even transferring text files is a fairly simple operation that takes very little effort.

Do not expect to transfer programs into the Amiga and run them. You may be able to transfer programs and look at the code. (BASIC programs on the C-64/C-128 are saved in tokenized format and thus will not look like BASIC listings, but you should be able to transfer and look at Assembly source code without any trouble, depending on your assembler.)

Also, do not expect the 1541/I571/I581 to perform like Amiga drives. They cannot read Amiga-formatted disks and they cannot be used to read MS-DOS disks with the "Transformer" software. (A 1541/I571/I581 cannot be used like the A1020 disk drive.) They cannot store nearly as much as an Amiga disk, and they are agonizingly slow. The latter is not the fault of Access-64; the drives were built slow in the first place. It has been said that the only advantage of a 1541 disk drive is that it is faster than typing.

If you have a lot of text files that you would like to transfer back and forth between an Amiga and a 64, Access-64 is probably worthwhile. If you have only a few files and a modem for each machine, you might consider using a telecommunications package to

transfer them (either through a null-modem or from a friend's house, or by uploading the files from one computer to your own E-mail box and then downloading them into the other computer). If you have a 1541/I571/I581 lying around, and you do not mind their slowness, and you just want some extra disk storage space, then Access-64 will work nicely. (Maybe you got a deal on 5 1/4" disks and have a few hundred in your drawers?)

If you have a 1525 or MPS 801 compatible printer that you want to use for printing listings or letters or anything that does not involve graphics, Access-64 should also work. You may have to play around before getting tabs and proportional spacing to print out... well, perhaps you should probably be thinking about a new printer, anyway.

To wrap it up: Access-64 is a nice little device that performs as advertised. It is *not* a software emulator. It allows you only to use the 64 disk drives and printers as Amiga peripherals. Printer use is bare bones ASCII (no graphics). Text files can be transferred from 64-formatted disks to the Amiga, then translated from PET ASCII into true ASCII. The drives cannot read Amiga disks or MS-DOS disks when using the Transformer software. They can be used as storage devices, but they have much smaller capacities and are much slower. Access-64 is easy to use and well integrated into the Workbench environment.

Depending on what you want to do, Access-64 might be just what you need as a step on the upgrade path.

GO-64!: NO CROWDS ROAR

Go-64! from Software Insight Systems is a C-64 software emulator for the A500, A1000 and A2000. (You need a parallel port conversion cable, *not* a simple gender changer plug, for the A1000, and these retail for about \$29.95 from a dealer.) The device plugs into the parallel port and lets you use 1541/I571 disk drives or C-64 compatible printers. Go-64! also lets you use C-64 joysticks, paddles and light pens.

Go-64! has its own Workbench disk containing the main program, a C-64 system Preferences for special software and a Notepad file for updates. When you click on the main program icon, you are given a title screen and then the Amiga pops into 64 mode. From there the Amiga behaves like a C-64 (or C-128 in the 64 mode). All disk access is the same as it would be if you were using a 64. BASIC uses the same commands and syntax as on a 64. Pokes and Peeks are pretty much the same as on a 64—with some differences (more on that later). The keyboard is also mapped similarly (which causes some confusion because the keys on an Amiga are not labeled like they ►

are on a 64). Beyond that, however, you start running into trouble.

Right at the beginning it should be stated that the people at Software Insight Systems do not claim 100% compatibility or even close to 100% speed. They are working on it but have a long, long way to go. They said that they sacrificed speed for compatibility whenever there was a conflict—and it shows.

Go-64! is slow. Very slow. A simple FOR/NEXT loop counting to 10,000 takes about 40 seconds, compared with 13 seconds for a real C-64. Writing to the screen takes a long time. In fact, anything that has to do with graphics or printing to the screen takes a long time. Graphics are what slows down Go-64! the most. Programs that are more computational than graphic will run faster, but do not expect either to be as fast as a C-64. You can expect a 64 program on the Amiga

to run anywhere from 30% to 90% as fast as it would run normally (if it runs at all). The company claims that the average speed is from 60% to 70% as fast.

Go-64! does not support peripherals that use the cartridge, cassette or USER ports (which eliminates most 64 modems and printer interfaces that get their power from the cassette port on the 64). It does support game paddles and light pens, but you must select these devices from the Preferences section. Go-64! does not support sound. The system will not crash when programs try to use sound—but you won't hear anything either.

Go-64! takes complete control of the Amiga, eliminating multitasking. This means that you cannot use any C-64 peripherals from the Amiga mode (printers, for example). You can run Go-64! from Workbench.

Go-64! is a byte-for-byte mapping of the 64, *but* the C-64 ROM routines have been rewritten completely, so there may be problems with programs that make calls to these routines unless they use the standard entry points. You will also have problems with programs that copy the 64 ROM routines to RAM and modify them. Go-64! offers a "solution" to this problem. Simply copy the real C-64 ROMs onto the Go-64! Workbench disk, and the program will use those instead. This is fine but it is a complicated procedure (as the manual states, "if you are a technically experienced C-64 owner"). You need telecommunications software with modems or direct connect cables and a file transfer program (for example, Disk-2-Disk) "which may require an Amiga 1020 disk drive," and you need a C-64. This is not the fault of Software Insight Systems. The C-64 ROMs are under copyright and the company cannot sell them. It is legal to copy the ROM routines yourself only if you own the C-64; it gets sticky otherwise (using a friend's 64, for example). The company does provide a BASIC program to perform the ROM download from a C-64; the rest is up to you.

Go-64! loads many programs, even copy-protected ones, in its normal mode. There are also special routines for loading programs that use Turbo load routines (special routines designed to speed up the loading of programs from a 1541). These routines (the company calls them Hyper-codes) are accessed through the 64 Preferences section of the program. Hyper-codes may be the biggest advantage in Go-64!. The company plans to offer disks of Hyper-codes for particular programs in the future. Hyper-code files will be available on Quantum Link, through a company BBS or directly through the mail. With Hyper-codes you can load and run different programs without changing the main Go-64! program. Select the appropriate Hyper-code (Geos, for example) from ►

A Comparison of Two C-64 Emulator Programs

	Go-64!	The 64 Emulator
Price	\$69.95	\$39.95 (plus \$20 for serial adapter)
Plugs into parallel port	yes	yes
Supports 1541/1571	yes	yes
Supports C-64 sound	no	yes
C-64 ROM routines included	no	yes
Supports multiple sprites	yes	with difficulty
Supports raster interrupts	yes	with difficulty
Supports turbo loaders	some (with Hyper-codes)	no
FOR/NEXT TO 10,000	40 sec.(aprox)	57 sec.(aprox)
Starts from Workbench	yes	no
File transfer utility	no	yes
Uses C-64 drives as Amiga drives	no	yes
Support CBM serial printers	yes	yes
Monochrome mode	no	yes
Alternate character set	no	yes
Re-map Amiga keyboard	yes	yes (partially)
Supports C-64 Basic	yes	yes
Supports C-64 disk commands	yes	yes
Upgrade policy	yes	yes
User support	yes	yes
Supports paddles, joysticks, light pens	yes	yes

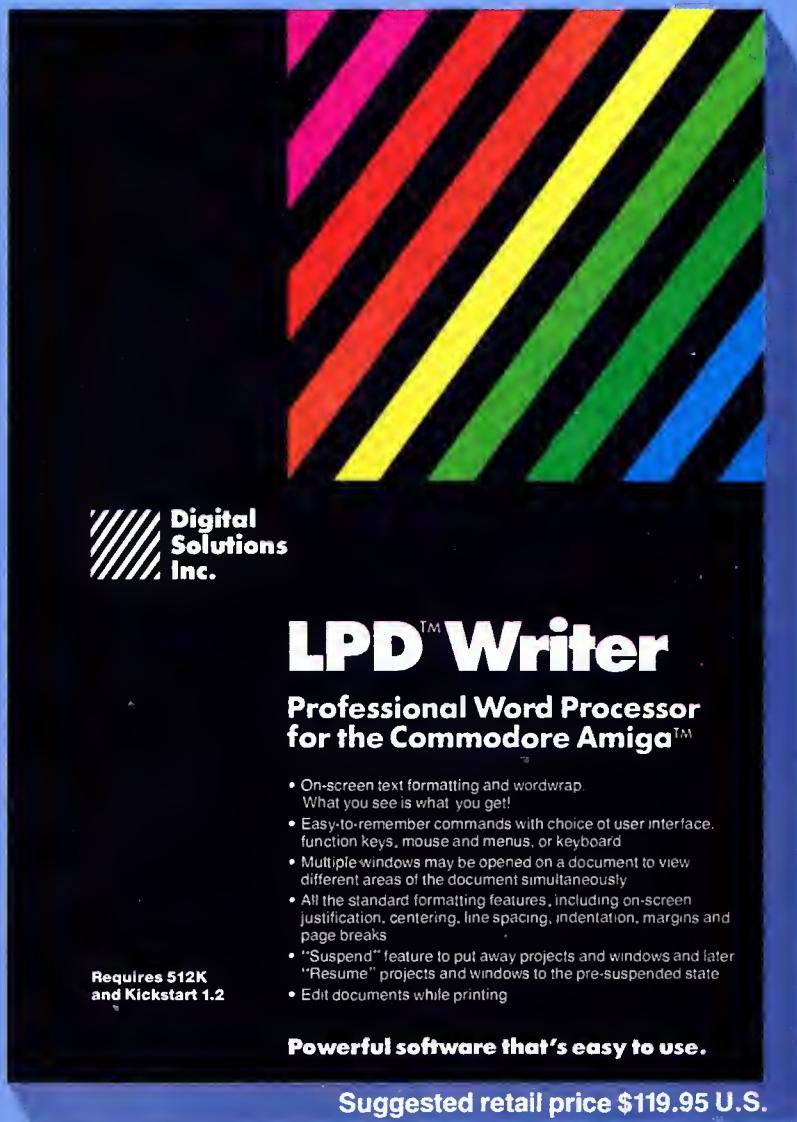
Powerful software that's easy to use.

Digital Solutions Inc. brings you the easy-to-use word processor specifically designed to use the power of your Commodore Amiga™.

LPD Writer™ allows you to see all projects and applications through windowing. Each project can then be "zoomed" up to full-screen size. You can execute a command by using the mouse, function keys or "short cut" command sequences. A "suspend" feature allows you to put away all projects and windows you are currently working on and a "resume" command will restore the projects and windows to the pre-suspended state. Also featured is on-line memory resident help.

This professional program gives you all the functions you would expect from a word processor plus the following features:

- On-screen text formatting and wordwrap. What you see is what you get!
- On-screen text enhancements including **boldface**, underlines, *italics*, ^{superscripts} and _{subscripts}
- No complicated format commands embedded in text
- On-screen help available any time
- Easy-to-remember command with choice of user interface: function keys, mouse and menus, or keyboards
- Built-in Spelling Checker up to 500,000 words
- Multiple documents can be edited at the same time
- Multiple windows may be opened on a document to view different areas of the document simultaneously
- All the standard formatting features, including on-screen justification, centering, line spacing, indentation, margins and page breaks
- Multiple headers and footers, displayed on screen
- Extensive editing tools, including ability to format, style, cut, copy and paste blocks of text
- Unlimited document length using linked files
- Side scrolling up to 250 characters
- Can be used to edit regular ASCII text files
- Supports international keyboard layouts
- Search and replace
- Mail merge for form letters; merge data may be supplied by sequential files
- Edit documents while printing
- And much more



Suggested retail price \$119.95 U.S.

**Digital
Solutions
Inc.**

2-30 Wertheim Court
Richmond Hill, Ontario
Canada L4B 1B9
(416) 731-8775

Circle 46 on Reader Service card.

If you can't find LPD Writer
at your local dealer, you can
Order Direct by calling
(416) 731-8775
(we ship in 24 hours)

the 64 Preferences section, and you are ready to go. Or not.

There are many, many programs that will not load and do not yet have Hyper-codes written for them. Even if you can get a program to load and run, it may be so slow as to make it useless. Most arcade games that load and run are worthless even at their hardest settings. (Most arcade games are graphics-intensive, which slows down Go-64! quite a bit.) Unless you want to see what it is like to score sixty billion on an arcade game, there isn't much point. Text adventures, illustrated text adventures, some arcade games and games that use more number-crunching than graphics (such as the chess game Sargon III) are more suited to Go-64!, but only if you can get them loaded in the first place. And the only way to find out if they load in the first place is to try them.

Programs like word processors, databases, spreadsheets and anything that does not rely on graphics or speed should work fine—again, if you can get them to load in the first place.

There are other minor problems with Go-64!, but they are insignificant compared with the two major problems. First, there are thousands of programs for the 64 out there and many of them use custom turbo loads—meaning that Go-64! may or may not load

them and may or may not have Hyper-codes for loading them now or ever. Second, the programs that do load and run are slowed down so drastically that most of them are rendered useless.

There is no way to tell ahead of time which C-64 programs are going to load, which will run properly if loaded and which will still be usable even if they do load and run properly. Go-64! may be useful for some people, but if, however, you are looking for a serious, practical way to upgrade to an Amiga, do not expect too much.

THE 64 EMULATOR: SHUT THE DOOR, SEE YOU LATER

The second program under review that is properly a software emulator is The 64 Emulator from ReadySoft. It is sold in three different configurations: without the serial interface, with an A1000 serial interface or with an A500/A2000 serial interface. Each serial interface plugs into the parallel port, and your C-64/C-128 devices plug into that. The 64 Emulator supports some Amiga hard-disk drives but does not claim to support all of them.

The 64 Emulator comes on its own Workbench disk and contains a configuration editor utility that lets you tell The 64 Emulator what hardware you have connected and assigns disk drives to various numbers and modes. You can, for example, use an Amiga drive to emulate a 1541 in the way it stores and retrieves data (if you want to use a 64 program to save and load files on an Amiga disk), but the Amiga drives will hold only as much as a normal 1541 (170K). The configuration editor also allows you to assign printer modes (enabling you to use an Amiga or 64 compatible printer for 64 software output). No conversion is done on the output to the printer—that must be handled through the software. The program supports Amiga modems but not C-64 baud rates of 50 and 75.

You must select what kind of input device you will use (joystick, Amiga mouse or light pen). The program enables you to emulate a 1350, 1351 or game paddles with the standard Amiga mouse. If you move the mouse without setting it to paddles in the configuration editor, however, random characters will be printed to the screen in 64 mode.

Additional features of The 64 Emulator are: emulation of the 1764 RAM expansion unit available for the C-64, a monochrome mode that speeds up the operation of many programs and the option of selecting an alternate character set that is easier to read than that of the standard C-64. The program also includes a file transfer utility to copy C-64 disks onto Amiga disks. Another feature worth noting is ▶

Product Information

Access-64

Dynamic Software Technologies Inc.
9420 Reseda Blvd., Suite #410
Northridge, CA 91324
818/360-2995
\$79.95

Marketed by:

Progressive Peripherals Inc.
464 Kalamath St.
Denver, CO 80204
303/825-4144

C-View

C Ltd.
723 East Skinner
Wichita, KS 67211
316/267-6321
\$49.95

Disk-2-Disk

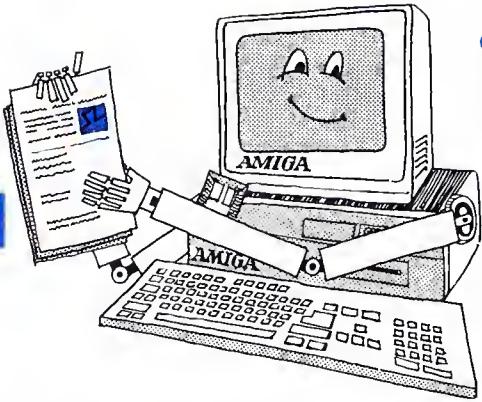
Central Coast Software
268 Bowie Drive
Los Osos, CA 93402
805/528-4906
\$49.95

Go-64!

Software Insight Systems Inc.
16E International Drive
East Granby, CT 06026
203/653-4589
\$69.95

The 64 Emulator

ReadySoft Inc.
PO Box 1222
Lewiston, NY 14092
416/731-4175
\$39.95 (without interface)
\$59.95 (with interface)



WE FEEL
IT IS UNFAIR
OF THE MAJOR
SOFTWARE COMPANIES
TO AVOID THE
AMIGA.



***Publishing Partner Professional,TM
designed to be better than the desktop publishing "standard."***

Publishing Partner Professional

Pagemaker*

■ We think desktop publishing should be enjoyable. Our user interface reflects this - have fun! And, if you need help, look in the manual; it even has an index!	There are books written on how to use it.
■ Your text will flow automatically around any irregular-shaped graphics giving a very professional look quickly.	A picture tells a thousand words - so who needs words?
■ Create crisp-looking, readable paragraphs. You can, with our auto-hyphenation, auto kerning, user definable kerning pairs, and auto-leading control all in increments down to 1/3600th of an inch!	They knew these functions are essential but leading only down to 1/2 a point?
■ Import those beautiful Amiga graphics from virtually any art program and print them in color or shades of gray. Or you can draw them as you go with our complete graphics toolbox.	Amiga graphics?
■ And, if you spell something wrong, the spell checking feature will find it for you, saving you time and perhaps embarrassment.	Hopefully you are a good speller.
■ Import from most all word processors including those with ASCII or IFF text formatting or have them running in the background.	It is vitally important to support word processors and they knew this.
■ We include drivers for virtually every printer, dot matrix or laser at no extra charge. So, now, you can create beautiful documents using the printer you already own.	They also realized that if the printer support is weak, why bother?
■ Need to change a word in one place or throughout the document? Our search and replace feature will make it quick and easy for you.	Do it right the first time.
■ It will always look great quickly, using our premade style sheets. Or, do it yourself with the tag and master page system.	It would sell better if they did.
■ You are very precise and you need flexibility, so our font point size range is from 1/50th of a point to 1310 points in 1/50th of a point increments! And, we use scalable fonts so no jaggies!	If you are average, the range of 4 to 127 points one point at a time should suffice.
■ You can view your document in 50%, full width, full page, multiple page, actual size, or 200%, or set your own between 15 and 999%!	You can view your document in only the five different ways they have picked for you.
■ We don't copy protect.	They too, know that professionals don't cheat.
■ You can open multiple windows with different documents or different pages and go from one to the other editing as you go.	Facing pages only please.

Publishing Partner ProfessionalTM - the new standard. Aggressively priced at only \$199.95.

ATTENTION PageSetter OWNERS!

We think you will like ours better. We are so sure, that for only \$50 we will send it to you. Call (314) 894-8608 or send your program disk and \$50 plus \$5 for shipping to Soft Logik. This is a limited-time offer.

* PageMaker V2.0

Circle 211 on Reader Service card.



Soft Logik CorpTM

PO Box 290071 St. Louis, MO 63129
(314) 894-8608 Fax (314) 894-3280

EMULATING HARDWARE THROUGH SOFTWARE— EVEN ON A 68000-IS A VERY DIFFICULT TASK.

the ability to access the configuration editor utility from within a 64 program by pressing the Control and Help keys simultaneously.

All of the C-64 BASIC commands are supported, as well as the disk drive commands. The keyboard has not been remapped completely, only the ESC, DEL, TAB, Left Amiga, FI0 and Backspace keys. This means that there are fewer things to remember when using the Amiga in the 64 mode. The 64 Emulator does support C-64 sound (a real plus), and the original C-64 ROM routines are included (we assume that ReadySoft licensed the ROM routines from Commodore).

Now for reality.

The manual that comes with The 64 Emulator states: "Due to the nature of The 64 Emulator, some programs will run between two and five times slower than the Commodore 64; others will run at full speed. This slow-down will not be noticeable on all programs." It would be very difficult to find a program where the difference between expected and actual running speeds was not painfully noticeable. BASIC is much slower (FOR/NEXT loop counting to 10,000 took about 57 seconds), graphics are much slower, printing is much slower, everything is much slower.

Another major problem with The 64 Emulator is that it cannot deal well with multiple sprites. They change color, flicker, even vanish. The 64 Emulator does not handle raster interrupts very well either. Considering that most commercial software uses sprites and/or raster interrupts, you can pretty much count on having problems.

The third major problem is that The 64 Emulator will not load programs that use turbo loaders, and there is no way to tell which commercial programs use them until you try to load them.

These are three very large problems and may combine to make The 64 Emulator almost worthless. Again, for programs that do not use turbo loaders, do not use multiple sprites or raster interrupts, and are not graphics-intensive or speed-critical, the 64 Emulator may be a good program. However . . .

HERE'S THE WRAP: WITHOUT THE . . .

C-View lets you use a C-64 monitor. It works well and may be a good investment if you want to postpone buying an Amiga monitor.

Access-64 lets you use the 1541/1571/1581 and CBM serial printers as Amiga peripherals. It transfers files back and forth easily between C-64-format disks and Amiga-format disks. It is not a software emulator and it does not claim to be. Integration of the C-64 devices into Workbench is handled very well. If you have a lot of text files you wish to move from C-64/C-128

disks to Amiga disks (and vice versa), or if you just want to use your existing C-64/C-128 drives for data storage, then this is a worthwhile device.

Go-64! is a software emulator that has some major problems. There is no sound. It is very slow. It will not load all programs that use turbo loaders, but the company is working on Hyper-codes that will let you load some of these programs. You must copy ROM routines from another 64 for some programs (a complicated procedure). It does handle sprites and raster interrupts, but the speed limitations may cause the sprites to behave erratically. It is slightly, but not much, faster than The 64 Emulator.

The 64 Emulator is also a software emulator and shares some of the problems of Go-64! and encounters some unique ones of its own. It does support C-64 sound. The configuration editor is available from within 64 mode. It contains exact copies of the C-64 ROM routines, so there is no need to copy them from an existing C-64. It is also very slow. It also has trouble with most programs using turbo loaders. Some programs using turbo loaders are supported, but require different versions of The 64 Emulator. It has trouble with multiple sprites and raster interrupts.

Bottom line: C-View is good if you want to use your 1702 monitor. Access-64 is good if you just want to transfer programs or use C-64 drives and printers with your Amiga. Go-64! and The 64 Emulator are about equally useless. Neither one can handle all turbo-loaded software. Both are painfully slow for just about everything. Neither one works well for programs that use graphics or speed-sensitive action. They both are okay (at best) on such software as word processors, databases and spreadsheets—but expect severe speed reductions.

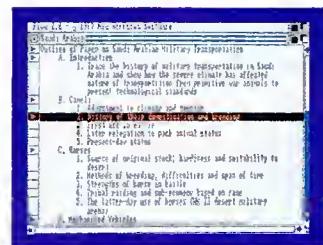
It would be great to say that you can buy an emulator and use your old C-64 software on your Amiga, but it is not completely true. You do not know which programs will work and which ones won't until you try them, and you will be disappointed with the results on the programs that will load and run.

In defense of Software Insight Systems and ReadySoft, a C-64 is a complicated and, in some ways, very sophisticated machine. The 6510 and SID chips are very efficient at what they do, and the software developers who have been working on C-64 software all these years have found ways to make these chips operate far beyond Commodore's original expectations. It is not surprising that trying to emulate hardware through software (even on a 68000) is a very difficult task.

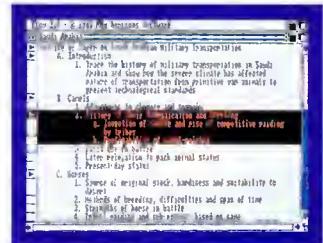
If you want 100% C-64 software and hardware compatibility, keep your old 64. The road from C-64 to Amiga is, unfortunately, still under construction. ■



Together, They'll Take Your Thoughts And Words Anywhere An Amiga Can Go.



Outline format organizes ideas and information. Select any topic to expand



Expand with subtext; then click to hide subtext. To change outline order, just drag any heading or paragraph to new position and click



Cut and paste between screens, up to four at once.

Inside Your Mind To Capture Ideas As They Happen.

Never let another brainstorm slip by. Turn it loose in Flow™, the idea processor for Amiga. Whether you are working on a term paper or a business prospectus, Flow's outline format lets you jot down ideas quickly to build a preliminary framework. Then expand those ideas with subtext. Click to see the details, then click again to hide them and keep the big picture up front. Flow's flexibility gives you freedom to eliminate, rearrange and manipulate ideas so easily, you'll never use a scratch pad again.

The same process also works wonders on catalogs or to-do lists, speedily reducing large amounts of random data to multiple levels of organization. It's also great for scheduling and tracking projects over a period of time. And when you are ready to turn that Flow outline into a finished paper, the document can be loaded into ProWrite or other Amiga word processing software for further work.

It's a snap to use, with most commands mouse or keyboard operative, and multi-tasking power as well. So let your thoughts go—with Flow!

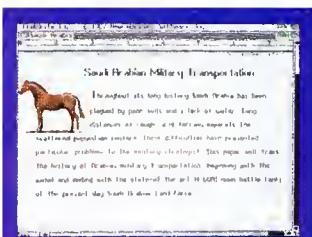
Over The Rainbow With The Only Multi-font Color Graphics Word Processor.

ProWrite™ masters the potential for Amiga word processing by giving you more than ho-hum words-on-a-page. Unleash the power of color in commanding headlines. Highlight key paragraphs or make important words jump off the page in full-spectrum hues. The possibilities are endless with ProWrite's wide variety of fonts, sizes and styles.

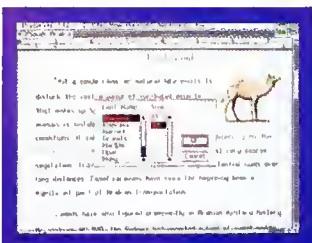
And when words alone aren't enough, punch up your document with IFF color graphics. Put text anywhere above, below or alongside the picture; even wrap words around the graphic for professional impact. And the active "what you see is what you get" principle means you know your printed output will live up to your best intentions.

Easy to use, ProWrite responds to mouse or key commands on most operations and features all the word processing tools you want: easy-to-set tabs and margins, multiple-line headers and footers, and paragraph-based formatting. Plus you can cut and paste among up to eight windows at once, and take full advantage of the Amiga's multi-tasking powers.

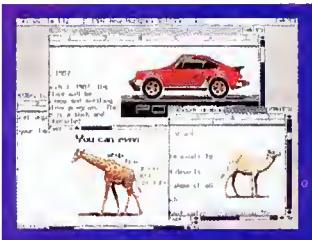
For any way you work with words, ProWrite is perfect: designed to combine creativity and versatility in an extremely easy-to-use package.



Use color in headlines or to highlight key words. Incorporate color graphics into copy.



Choose the font, style, point size and color that best suits your work.



Cut and paste between screens, up to eight at once. Wrap words around graphics for a professional look.

New Horizons
S O F T W A R E

First In Personal Productivity And Creativity.

P.O. Box 43167/Austin, Texas 78745/512-328-6650

Flow and ProWrite are trademarks of New Horizons Software, Inc. Amiga is a registered trademark of Commodore-Amiga, Inc.

Circle 38 on Reader Service card.



TIMESAVER,

The Macro Clock, is THE most useful hardware product for the Amiga!

- Real Time Clock/Calendar with battery back-up
- 7K of Fully Programmable battery backed-up Macros
- Takes up no ports or desktop space
- Works with all Amiga software
- Password Protection
- Autostart macros
- All macros enabled or disabled any time

\$79⁹⁵
(suggested retail)

At Your Amiga Dealer TODAY!

© date 01-Jun-87 09:28

Unbeatable SCSI Flexibility: No other Amiga hard drive can offer you: Capacities from 20MB to 760MB...plug-in compatibility with optical (WORM) drives, removable cartridge drives & CD ROMs...optional networking capability...dual-drive compatibility with ST506 and add-ons, allowing use of up to 14 hard drives with your Amiga!

A REAL Track Record: C Ltd has been shipping Amiga hard drives since November, 1986. With thousands of units in use, you can count on C Ltd's proven hardware & software reliability.

Extraordinary Support: Call our technical support line, and you talk to the people who actually build the C Ltd products. Each drive is supplied with a complete technical manual. Each drive is fully formatted, with 10 MB of useful public domain software and commercial demo programs.

Cheaper By The Megabyte...

The **more** megabytes you buy, the **less** each megabyte costs you!

22MB	\$ 999.95
33MB	1249.95
44MB	1499.95
50MB	1599.95
60MB	1999.95
80MB	2499.95
150MB	3299.95

additional sizes up to 750MB available upon request.

The Industry's Longest Warranty

One-year parts & labor warranty.

FAX: 316/267-0111

TELEX: 910/240-6563



Swapping Data . . . Clipboard-Style

The Exec's clipboard device can add useful cut-and-paste functions to many of your applications. And our clipboard demo in C will get you started on the right track.

By David T. McClellan



Smart Amiga owners have long been aware of the potential power of AmigaDOS's kernel. AmigaDOS is built on top of both sophisticated hardware and a workhorse of a kernel—the Exec. (These are system-software routines that control many major functions of the computer.) The Exec has been profiled before (see the ROM Kernel manuals and my own article, "Executive Control: Introduction to the Amiga Kernel," *AmigaWorld* Special Issue Reference Guide 1987), but one of the more useful—and least used—Exec functions is the clipboard.

Neglecting use of the clipboard in the Amiga's multi-tasking environment seems particularly egregious, because here it is very easy to imagine situations where one running program can cut data to a file and another paste it in, without either program "talking" directly to the other. Apple's Macintosh has a clipboard that has proved to be one of the best ways for two user programs to swap data. The Mac allows one program to write data to the clipboard and another program to read that data from it.

Well, Amiga users needn't worry about the Exec's clipboard languishing in disuse any longer. NotePad for AmigaDOS 1.2 uses the clipboard (run two Notepads simultaneously, and what one cuts, the other can paste). Communications and graphics programs are using it now for sharing chunks of data. Because the Amiga Clipboard supports a standard data format (IFF), an application can find out data type and structure before it reads material from the clipboard. Also new Exec documentation (the "Libraries and Devices" volume of the Addison-Wesley *ROM Kernel Reference Manual* and the *Amiga Programmer's Handbook, Vol. II*) now covers the clipboard (the Addison-Wesley manual even has a sample program). But if heavy reading puts you off, I've written what I hope is a handy little clipboard demo in C to show you how to use it.

As an Exec DEVICE, the clipboard is something you open, read and write, and close just like the Serial or Trackdisk devices. Because several tasks can use the same clipboard, there are also specialized I/O commands that coordinate access to the clipboard by different tasks. There can be more than one clipboard UNIT open, each with its own store of information or space to put data in. The data in a given clipboard can reside in memory—either in a user application's memory (data POSTed but not yet written to the clipboard) or in the clipboard's memory—or on disk. And even though the clipboard is a software device (one you can't see), the data in it can survive reboots and ►

powerups. This is possible because when all programs that use a particular clipboard unit close the clipboard, the data the unit contains is saved in a special file in the *devs/clipboards* directory on your Workbench disk. Each clipboard unit gets its own file; the data from unit 0—the clipboard unit that both Notepad and my ClipDemo program use—goes into file “*devs/clipboards/0*.”

CLIPBOARD DATA FORMATS

In order for programs to share data on a clipboard, they must know the type and structure of the data contained in the clipboard. Commodore-Amiga chose to use the IFF (Interchange Format Files) standard for clipboard files. Clipboard files, like other IFF files, are structured. Each consists of one or more “chunks,” which consist of header information that tells programs the type and size of the data, followed by the data itself, which can be structured further. Standard IFF formats (or FORMs) exist for bitmap pictures (ILBMs, or interleaved bitmaps), formatted text (FTXT) and simple music (SMUS); more are evolving. Notepad clips are FTXT FORMs, which consist of ASCII text with font and style information imbedded as needed. My clipboard demonstration program processes the most simple type of FTXT data.

The Clipboard device also provides for private data formats, in cases where there is no IFF FORM that fits your data, or where your program will only save data in the clipboard for its own use. The IFF formatting of the clipboard is only requested; it is not required.

CLIPBOARD I/O

The clipboard device is opened with the Exec OpenDevice() call, as in:

```
OpenDevice ("clipboard.device", unit, clipreq, 0);
The unit parameter is the unit number of the clipboard you are opening; the clipreq parameter is a pointer to an initialized IOClipReq struct (defined in devices/clipboard.h—see figure at top of the next column). This struct is similar to the IOStdReq struct I used in the Exec demo in my “Executive
```

```
struct IOClipReq {
    struct Message io_Message;
    struct Device *io_Device;
    struct Unit *io_Unit;
    io_Command;
    UBYTE io_Flags;
    BYTE io_Error;
    ULONG io_Actual;
    ULONG io_Length;
    STRPTR io_Data;
    ULONG io_Offset;
    LONG io_ClipID;
};
```

Control” article cited above, with the addition of one extra field at the end—the *io_ClipID*. This ID field is used in reads and writes to synchronize multiple cuts and pastes with other applications. (See the OpenClip() routine in Listing 1 for an example of setup and opening.)

The CloseDevice() call—CloseDevice (clipreq)—will close an open clipboard. All other I/O to the clipboard is done through the standard device I/O routines: DoIO() for synchronous I/O, and SendIO(), CheckIO() and WaitIO() for asynchronous I/O. The type of I/O done by DoIO() or SendIO() is specified in the IOClipReq passed to the routine; this handles both reads and writes. I will use DoIO() in the following discussions.

After you have opened the clipboard, you can read and write to it as you wish. To start reading, set your IOClipReq struct’s *io_Command* field to CMD_READ, set fields *io_Offset* and *io_ClipID* to 0, put a pointer to your buffer in *io_Data* and to its size and *io_Length* and call DoIO(). When the DOIO() routine returns, your data will be in your buffer. The IOClipReq’s *io_Actual* field will tell you how much you actually read—if it is less than the number to which you set *io_Length*, you have read all there is in the clipboard. For each subsequent read of the same data in the clipboard, leave *io_ClipID* and *io_Offset* alone and the clipboard device will give you the next sequential chunk of data. When you hit end-of-clip, tell the clipboard you are done by issuing one more CMD_READ with *io_Length* set to 1 and *io_Data* to NULL, so other tasks can write to the clipboard again. Once you start reading, all other tasks’ writes to the clipboard will wait until you have finished reading all the data in the current clip. See the ReadClip() routine in Listing 1 for an example.

If you wish, you can do “random access” I/O to the clipboard. Set the *io_Offset* field to a value other than 0 and *io_Data* to NULL, and the clipboard will “seek” to that byte, ready for your next read. This is one way to skip to the end of a clip (or “cut”).

You write to the clipboard in similar fashion to reading to it. Set the *io_Command* field of your IOClipReq to CMD_WRITE, point *io_Data* to your data buffer, put its length in *io_Length* and go to it. For the first write, set *io_Offset* to 0 and *io_ClipID* to 0; leave them alone for subsequent writes►

Clipboard Reference Sources

Amiga ROM Kernel Reference Manual: Libraries and Devices
Addison-Wesley Publishing Co.
 Jacob Way
 Reading, MA 01867
 617/944-3700
 \$33.95

Amiga Programmer’s Handbook, Vol. II
SYBEX Inc.
 2021 Challenger Drive #100
 Alameda, CA 94501
 415/523-8233
 \$24.95

Micron's Amiga Series: Highest quality memory boards from America's Memory Supplier



Affordable
Memory Expansion
from a Company
You can Trust

- Interchangeable on Amiga 2000/1000*/500*
- 2 Megabytes
- Quick Memory Diagnostics on Power-up
- Zero Wait-States
- Discrete DRAM Controller
- Hardware Refresh
- Diagnostics Included
- Recoverable RAM Disk
- Auto Configuring (Amiga DOS 1.2)

*Expansion chassis and passthrough provided
Amiga is a trademark of Commodore Electronics Ltd.

Full 30-day Money Back Guarantee
For Orders and Information, contact your local
Commodore/Amiga computer store or phone toll-free:

1-800-642-7661

MICRON
TECHNOLOGY, INC.

America's Memory Supplier

Systems Group
2805 E. Columbia • Boise, ID 83706 • (208) 386-3800

going to the same "cut" of data. When you have finished writing the current cut of data, consisting of one or more sequential writes, tell the clipboard this set is complete by calling DoIO() with the IOClipReq's io_Command field set to CMD_UPDATE. Other tasks can then read the data. See WriteClip() and the routine that calls it—clip_iff_str()—in Listing 1 for examples of this method.

The clipboard device provides three special I/O commands for special circumstances. If your program has a large chunk of data to cut to the clipboard, or if it has data in a private format, it can tell the clipboard the data is available by using the CMD_POST command in the IOClipReq's io_Command field with a DoIO() call. This does not write the data; it merely tells the clipboard that

Listing 1. Clipboard demo program.

```
/* ClipBoard Reader Demo, February 1988 AmigaWorld
David T. McClellan Sept. 1987
This program will create its own little window for
user interaction; run it and Notepad at the same
time to cut from the Notepad file for ClipRdr to
read, and clip lines for Notepad to paste.
Compiled with Amiga Lattice C compiler;
Invocation (on AmigaDos 1.2 CLI): clipdemo */
/* Include Files */
#include "exec/types.h"
#include "exec/exec.h"
#include "devices/clipboard.h"
#include "graphics/gfx.h"
#include "graphics/gfxbase.h"
#include "libraries/dos.h"
#include "libraries/dosextens.h"
#include "stdio.h"
/* Some DEFINEitions */
#define DFLT_NLINES 8 /* Default number of lines
for show_buf() to display at one time.*/
/* Type-of-write designators for WriteClip
(its definition is below) */
#define WCLIP_FIRST_WRITE 0 /* First write of set */
#define WCLIP_CONT_WRITE 1 /* Continuation write */
/* not last. */
#define WCLIP_LAST_WRITE 2 /* Last write of a set:
done with "cut" operation. */
/* Cleanup Defines and Longword - for my standard
close-up-shop routine */
#define CL_GFXLIB 0x0001 /* Close graphics lib */
#define CL_CONSOLE 0x0002 /* Close console */
#define CL_CLIPDEV 0x0004 /* Close clipboard */
long closeflags = 0; /* Close-up-shop flagword */
/* Library BasePtrs */
struct GfxBase *GfxBase;
/* File handles and IO Requests */
int cons; /* Console file handle */
struct IOClipReq *clipreq;
/* Clipboard i/o struct */
/* Hex digit -> char values for show_buf() */
char hextab[16] =
{ '0', '1', '2', '3', '4', '5', '6', '7',
  '8', '9', 'A', 'B', 'C', 'D', 'E', 'F' };
/* Function Declarations */
/* Amiga Functions */
int OpenDevice();
struct MsgPort *CreatePort();
APTR AllocMem();
APTR OpenLibrary();
int Open();
/* My Own Functions */
struct IOClipReq *OpenClip(); /* Open a clipboard */
```

Listing continued on p. 90

data is available upon request. When you send the CMD_POST command, you must pass the address of a MsgPort you have created in the IOClipReq's io_Data field with it. This message port will be used later to tell your program when data is being requested. At that time the program will do the CMD_WRITEs to actually cut the data into the clipboard, setting io_ClipID in the IOClipReq to the ID specified in the satisfy message's sm_ClipID field (see below). After a CMD_POST, your program should be ready to receive the satisfy message at any time (include it in your Wait() event flags) and satisfy the request as soon as it comes along. The satisfy message comes to your program in the following struct:

```
struct SatisfyMsg
{
    struct Message sm_Message;
    /* Message is always 6 bytes */
    UWORLD sm_Unit;
    /* Which clipboard unit */
    LONG sm_clipID;
    /* io_ClipID value for writes */
};
```

This operation allows a program to have large sets of data available for sharing, without paying the price of writing them until they are needed. If the satisfy message request never comes, the program never has to write the data.

When you do a CMD_POST operation, DoIO() returns the current Clip ID in your io_ClipID field. You can use CMD_CLIPREADID and CMD_CLIPWRITEID to check on the most recent clips read and written later; if the current Clip ID for writing exceeds that of your post, it is obsolete and can be abandoned.

DEMO PROGRAM

The accompanying program does simple reads and writes to the clipboard, based on single-letter commands read from the console. It expects to read and write Notepad-style data in the clipboard. I start up Notepad via the Workbench and ClipDemo via the CLI or the Workbench. Then I cut data from Notepad and tell ClipDemo to read it (it will print it in hex and ASCII in case you get something other than text). ClipDemo will then write a string to the clipboard and do a paste in Notepad. It is surprising how easy clipboard I/O is. The utility routines OpenClip(), CloseClip(), ReadClip() and WriteClip() can be reused in other code as you please.

Have fun with it and add clipboard cut-and-paste functions in any new applications you do. ■

David T. McClellan is a contributing editor to AmigaWorld. Address correspondence to him at 104 Chevron Circle, Cary, NC 27511.

Real time video and music.

SunRize introduces PERFECT VISION and STUDIO MAGIC to enhance the look and the sound of your Amiga.

Actual Unretouched Photos



STUDIO MAGIC is the ultimate music and sound workshop with features superior to editors selling for thousands more. Compatible with model 1000, 500 and 2000 Amigas. Input sounds from stereo, VCR or microphone (with PERFECT SOUND interface) or a keyboard (with MIDI interface).

Create flanges, delays, echoes, compression and expansion to speed up (or slow down) without pitch change, do backward masking, etc. Other features include comb filter, DC bias, AM, Fast Fourier Transforms and visual representation of the sounds in the buffer.

A dozen menu driven tools allow you to make a child's voice sound like a titan or turn a TV pitchman into an alien from another galaxy. Record MIDI input in real time. Mix voices and instruments and control their playback using a MIDI keyboard. Overdub from 16 digitized "sections" and play back four of them at a time. Supports advanced MIDI features such as tempo adjust and external sync. Store sounds in IFF "instrument" or "one-shot" (8SVX) files for use with other compatible programs.

SUGGESTED RETAIL PRICE: \$99.95

PERFECT VISION is the state of the art, real time video digitizer for use with model 1000, 500 and 2000 Amigas. Input from a color (or black and white) video camera or a VCR. Perfect Vision will digitize the image, display it in 4096 colors (camera input only), then store it as IFF for later use in compatible programs. Captures an image in 1/60 of a second — 600 times faster than the competition. Supports 320x200 and 320x400 HAM and 16-color modes.

SUGGESTED RETAIL PRICE: \$219.95

Available from Amiga dealers across America. For product information and support call:



SunRize Industries
3801 Old College Road
Bryan, TX 77801
(409) 846-1311

AMIGA is the registered trademark of Commodore—Amiga, Inc. Studio Magic and Perfect Vision are registered trademarks of SunRize Industries.

SupraDrive

Amiga™ Hard Disk

New Low Prices!

SupraDrives for the
Amiga 500/Amiga 1000

20MB SupraDrive	\$ 799.00
30MB SupraDrive	\$ 995.00
45MB SupraDrive	\$1195.00
60MB SupraDrive	\$1795.00



Improve Your Computer's Performance...

- * 20, 30, 60, and 250MB Capacities
- * Real-time Clock With Battery Back-up
(Optional on Amiga 500)
- * SCSI Expansion Port (DB-25 Connector) for adding additional SCSI Devices
- * 1MB, 2MB, and 4MB RAM expansion capability in the SupraDrive Interface
- * Amiga Buss pass-through

- * Direct Memory Access (DMA) interface for high-speed data transfers
- * Mounts internally in the Amiga 2000
- * 20, 30, and 60MB Capacities
- * SCSI expansion port

... With a SupraDrive.



Internal DMA SupraDrive for Amiga 2000



SupraDrive for Amiga 1000

Supra Corporation

1133 Commercial Way / Albany, OR 97321 U.S.A.
Phone: (503) 967-9075 / Telex: 5106005236 (Supra Corp)

AMIGA is a registered trademark of Commodore-Amiga Inc.

Circle 208 on Reader Service card.

The Numbers Game

No, the "sheets" discussed here are not for playing the numbers or the ponies, but if you need number crunching power, here's the "dope" on four spreadsheet programs for the Amiga.

By William B. Catchings and Mark L. Van Name

SPREADSHEET PACKAGES HAVE played an important role in the development of personal computers. It is difficult to discuss the Apple II without mentioning VisiCalc, or the IBM PC without Lotus 1-2-3. While Apple's Macintosh made its early impact primarily with its graphic abilities, one of its best-selling software packages is a spreadsheet, Microsoft's Excel.

The Amiga sold initially because of its powerful color graphics and sound capabilities. Many of these early users did without a spreadsheet package, although almost everyone, including artists and musicians, can use one. As the Amiga community expands, solid business software is a must. Happily, there are many Amiga spreadsheet packages available today.

In this column we will take a quick look at four: Logistix from Grafox, Haicalc from Haitex Resources, Analyze! from Micro-Systems Software, and MaxiPlan Plus from Oxxi. Owing to space limitation, we cannot review these products exhaustively. Instead, we will try to give you a flavor for Amiga spreadsheets in general and the operation of these four in particular.

THE POST POST PARADE: INTRODUCING THE FIELD

Like most spreadsheets, all four of these products follow the standard cell num-

bering scheme—letters for columns, numbers for rows—and spreadsheet model established by VisiCalc and 1-2-3. Logistix and Analyze! use / commands like those of 1-2-3. They also share many commands with 1-2-3, but none of them is compatible with 1-2-3. For example, Logistix has a /g (for global) command that 1-2-3 does not. If you are familiar with 1-2-3, you will probably find this similarity a mixed blessing. It makes it easy for you to get going, but the differences will often prove frustrating.

Haicalc also offers / commands, but they are not compatible with 1-2-3. You can execute these commands either by

typing or by picking them from standard Amiga menus. MaxiPlan Plus makes no attempt at 1-2-3 command compatibility.

You will quickly find that none of these spreadsheets allows you to work on any really large worksheet if you have only 512K of memory on your Amiga. For serious work you need at least 1MB of memory, and more is better. Haicalc, which uses a sparse matrix data storage model and provides the fewest features and functions, is the least memory-intensive. Its documentation claims that on a 512K Amiga you can have 2,900 cells of 50 characters of text each.

All but MaxiPlan Plus claim to work in ►



Four spreadsheets now available for the Amiga.

512K and definitely do: That's all the memory we allowed on our benchmark system. Even MaxiPlan Plus, which requires 1MB, worked fine on small worksheets in 512K. All of them will also be right up against the wall in that amount of space. For example, on a 512K Amiga, Analyze! could not handle a 25 x 25 worksheet, while Logistix used over a quarter of its available memory on our benchmark worksheet. In addition to the extra memory, a hard disk is almost mandatory if you plan to use large worksheets regularly.

While not an issue for those who use only Amigas, the ability to access data from spreadsheets on other systems is crucial for many users. The most widespread office combination is Lotus 1-2-3 on an IBM PC or compatible. People often want to be able to work on their spreadsheet data at home as well as in the office. To do this you first must get the data onto a disk that the Amiga can read. If you do not have an Amiga 5.25" disk drive, you typically can accomplish this by using a data transfer program, such as Kermit, or by using a package that moves data between the different

operating systems, such as DOS 2 DOS from Central Coast Software.

Once you have the data on an Amiga floppy, however, you have to be able to use it. Fortunately, all of these products except Haicalc can import data from a 1-2-3 spreadsheet. Saving the results of your work in a form you can take back to the office is another matter: Only Analyze! can write worksheets in 1-2-3's format.

HANDICAPPING THE CONTENDERS: PERFORMANCE

Enough about working with other systems. Let's get to the question everyone always asks: How fast are these products?

To answer this question, we timed three common operations: loading a worksheet, storing a worksheet and doing a recalculation. Our test worksheet was 25 columns by 16 rows. Cell A1 was a constant, while every other cell was a simple calculation: A1*1.1. We loaded and saved all data in the format native to each package. Our test system was an Amiga 1000 with 512K of memory and two disk drives, one holding the product and one holding the data disk. We timed

all three packages with a watch, and all results are the average of three timings. We considered the operation to last until the screen was finished updating. Table 2 gives the results of these tests.

The news is neither particularly good nor bad. All are bearable, but none are as fast as we had hoped. Analyze! turned in the fastest recalculation time, beating the others by a factor of two. Logistix won the other two tests. MaxiPlan Plus is the slowest package, although it would be about the same as the rest if it did not perform a mysterious and seemingly unnecessary second screen repaint after the operation seems to be done.

Each product has some interesting aspects beyond its performance and the general data in the tables. We briefly discuss each one below, in alphabetical order by company name.

LOGISTIX

You encounter the most annoying thing about Grafox's Logistix the moment you try to use it: It is the only copy-protected product. It uses a dongle for copy protection, which is one of the least offensive techniques, but nonetheless we wish that software companies would abandon copy protection once and for all. The dongle is a small device that you attach to the second mouse port and which contains a piece of data that the program checks when it starts. This seems harmless enough, but it could be a problem for users who normally have a clock or joystick connected to that port.

Logistix is a large, serious package. Its maximum worksheet size is not as large as MaxiPlan Plus allows, but its 1,024 columns by 2,048 rows is enough for almost everyone. Its manual contains over 400 pages and a decent index, so while there is a lot to read, you can find what you're looking for fairly easily. Oddly, it provides not only the spreadsheet and complementary graphing capabilities that you expect in a modern package, but a project management function as well. Almost half of the manual is devoted to this capability. If you need PERT or GANTT information as well as a spreadsheet, this is a great combination. For most of us it is just an interesting sidelight.

Logistix provides over 70 functions, including all of those standard for arithmetic and trigonometry. It also offers a good set of financial functions, including ►

Table 1. Features and Functions of Four Amiga Spreadsheets.

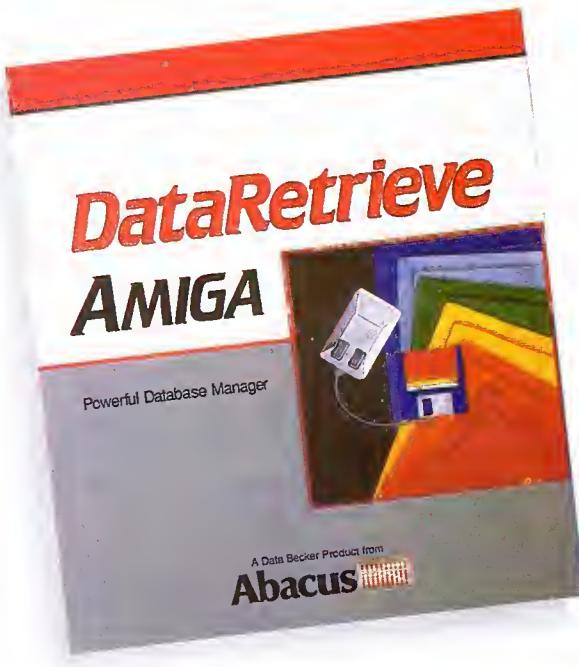
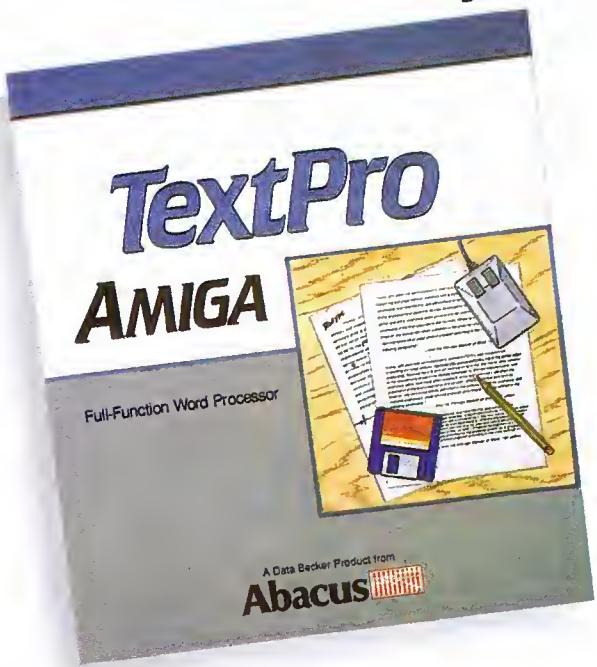
Product	Logistix	Haicalc	Analyze!	MaxiPlan Plus
Version we tested	1.1	1.7	2.0	1.8
Price	\$149.95	\$59.95	\$149.95	\$199
Max. worksheet size (columns x rows)	1024 x 2048	9000 x 9000	none given	512 x 65,530
Number of math functions (approx.)	70 +	4	40 +	70 +
Macros	Yes	No	Yes	Yes
Graphing abilities	Yes	Yes	Yes	Yes
Reference card	Yes	No	No	No
Key Template	Yes	No	No	Yes
Copy Protected?	Yes	No	No	No
Import 1-2-3 data	Yes	No	Yes	Yes
Export 1-2-3 data	No	No	Yes	No
Standard filename extension	.lgx	none	.sht	.plan
Number of diskettes in distribution	2	1	1	2
Customer support number in manual?	Yes	Yes	Yes	Yes

Table 2. Benchmark Results for Three Standard Spreadsheet Functions (in seconds).

Product	Logistix	Haicalc	Analyze!	MaxiPlan Plus
Worksheet Load	6	6	7	12
Worksheet Store	5	6	8	15
Recalculate	4	3	2	5

AA rated software Amiga and Abacus

from a name you've learned to count on



Circle 124 on Reader Service card.

TEXTPRO—The full-function wordprocessing package that shares the true spirit of the Amiga—easy to use, fast and powerful with a surprising number of "extras". Fast formatting on the screen: bold, italics, underline, etc. Centering and margin justification. Page headers and footers. Automatic hyphenation of text. Customize the **TextPro** keyboard and function keys to suit your preferences. Merge IFF-graphics right into your documents. Includes BTSnap for saving IFF graphics. This package can also convert and use other popular wordprocessor files. **TextPro** sets a new standard for wordprocessors in this price range. Easy to use and packed with advanced features—the ideal package for all of your wordprocessing needs. \$79.95

BECKER TEXT—More than just a wordprocessor. **BeckerText** gives you all of the easy-to-use features found in other word-processors, plus it lets you do much more. Merge graphics into your documents, automatic hyphenation, table of contents and indexing. Perform calculations of numeric data within your documents. Print multiple columns of text. Built-in spelling checker checks as you type. Output to most popular printers. When you need more from your wordprocessor than just wordprocessing, you need **BeckerText**. Available Feb. \$150.00

ASSEM PRO—Program your Amiga in assembly language with ease. **AssemPro** is a completely interactive assembly language development package. Editor with multiple windows, block operations and search and replace. Fast two-pass macro assembler does the linking for you automatically. Perform conditional assembly. Advanced debugger with 68020 single-step emulation. Built-in disassembler and reassembler. Supports 68010 if installed. Includes entire library of functions. Everything is included for hassle-free development. \$99.95

DATA RETRIEVE—Powerful database for your Amiga that's fast, has a huge data capacity and is easy to use. Now think **DataRetrieve**. Quickly set up your data files with onscreen *mask* templates. Select commands from the pulldown menus or time-saving shortcut keys. Customize the masks with different text fonts, styles, colors, sizes and graphics. **DataRetrieve** is easy to use—but has the professional features you need. Password security for your data. Sophisticated indexing and searches. File size limited only by disk space. Customize function keys to store macros. Easily outputs to most popular printers to produce form letters, mailing labels, index cards, reports, etc. Data management couldn't be easier. \$79.95

Ask about our new Amiga books

If your dealer doesn't carry Abacus products, then have him order it for you. Or order direct using the following order blank or by calling: (616) 698-0330

Qty. Products Price Totals

TextPro Amiga	\$79.95	_____
DataRetrieve Amiga	\$79.95	_____
AssemPro Amiga	\$99.95	_____
BeckerText Amiga	\$150.00	_____
In USA add \$4.00 for shipping		_____
Outside USA add \$12.00 per item		_____
Mich. residents include 4% sales tax		_____
Total amount (US funds)		_____

Payment: MC VISA Check Money Order Card # _____

Credit card expiration date: ____ / ____

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: _____

L1

Please note our new
address and phone numbers

You can count on
Abacus

Available at Amiga
dealers everywhere

Dept. L1 • 5370 52nd Street SE • Grand Rapids, MI 49508

Phone 616/698-0330 • Telex 709-101 • Telefax 616/698-0325

Call or write today for your free Amiga software and book catalog and the name of your nearest dealer. You can order direct by phone using your VISA, American Express or MasterCard or mail us your completed order blank. 30-day money back guarantee on software. Dealer inquiries welcome—over 2400 dealers nationwide.

PV (Present Value), NPV (Net Present Value), FV (Future Value), PMT (for loan "PayMenT" calculations) and IRR (Internal Rate of Return).

Beyond these computational functions, it also contains an excellent macro language and very strong graphing capabilities. You can produce a wide variety of graphs, among them a number of types of pie charts, bar charts, line graphs and scatter and area plots.

Logistix also provides the best ability to import data from other packages. Its manual contains a chart that shows how its functions correspond to those of 1-2-3 and SuperCalc. It can import data from files written by several non-Amiga packages, including dBase, 1-2-3 and SuperCalc, as well as DIF text and ASCII files that contain fields separated by commas. It can also export data into the latter two formats.

Some of this strength at working with other packages undoubtedly comes from the fact that Logistix was first developed for MS DOS and then ported to the Amiga. Unfortunately, this background has led to a peculiar mixture in the user interface. It uses / commands like 1-2-3 but is not fully compatible with that program. You can manipulate windows with

the mouse, and it works within the standard Amiga multitasking environment. To move around on the worksheet, however, you must use the arrow keys, not the mouse. Such odd combinations often make it frustrating to use.

Overall, this is a solid, powerful product with good documentation. It is not integrated as well with the Amiga as it should be, and the dongle used for copy protection is nothing but a pain. Beyond these problems, however, Logistix is an awful lot of power for a very reasonable price. As is true of most of these packages, Logistix offers more power for your dollar than the vast majority of IBM-PC spreadsheet products.

HAICALC

Haicalc is a basic spreadsheet program that was designed for the Amiga and uses its interface well. You can execute all of its commands from standard Amiga menus, run it in a multitasking environment and even set the font to be used by each cell. It uses a sparse matrix storage scheme and dynamic cell allocation to manage memory efficiently. It can produce bar, line, point and pie charts. It also costs less than half as much as any of the other products.

Unfortunately, there is a lot of bad news to go with the good. Haicalc has a long way to go to become a serious spreadsheet program. It has only four math functions: SUM, MAX, MIN and AVG. It cannot import or export data from 1-2-3. It also has some odd rough edges. For example, if the window is full, you can use the cursor to scroll to the left but not to the right. To move to the right you have to use the Goto command. You can copy formulas, but you cannot make cell references in formulas absolute.

It also does not always act as a unified product. You can build graphs, but you must first start Haicalc and then start a graph program (Pie or Bar, for example). You cannot print these graphs from the program; instead you must use a screen-printing utility.

If you need large but unsophisticated worksheets, or if you want a product that is simple and easy to learn, Haicalc could be a bargain. If you need to do any serious spreadsheet tasks, it probably will not be up to the job.

ANALYZE!

Analyze!, from Micro-Systems Software, is a powerful product that does not offer quite as much as Logistix but provides a great deal more than Haicalc. It states no maximum spreadsheet size, so memory is probably the limit. Sporting a 220-page manual, Analyze! offers documentation that is thorough and complete, with decent tutorials and a reasonable index. It offers over 40 functions, including all of the standard arithmetic and trig ones, as well as all of the standard financial functions we mentioned earlier except IRR.

Analyze! also provides a reasonable set of the "extras" that modern spreadsheet users have come to expect. Its macro capability is sufficient for most users. Its graphing functions include bar charts and stacked bars, pies, line graphs and 3-D bar charts.

Analyze! is one of the nicer results of trying to achieve a basic compatibility with 1-2-3 while at the same time preserving the essential flavor of the Amiga. For example, its functions start with the 1-2-3 @ prefix, and a great many of its / commands are compatible with those of 1-2-3. It is also the only one of the group that can both read and write files in 1-2-3 format. At the same time, its good use of the mouse for moving around and ►

Product Information

Logistix

Grafox Limited
65 Banbury Road
Oxford OX2 6PE
England
Tel: Oxford (0685) 516281

Distributed in the U.S. primarily by:

Progressive Peripherals & Software
464 Kalamath Street
Denver, CO 80284
303/825-4144
\$149.95

Haicalc

Haitex Resources
208 Carrollton Park
Suite 1207
Carrollton, TX 75006
214/241-8030
\$59.95

Analyze!

Micro-Systems Software
4301-18 Oak Circle
Boca Raton, FL 33431
305/391-5077
\$149.95

MaxiPlan Plus

Oxxi
PO Box 4000
Fullerton, CA 92634
714/999-6710
\$199
(MaxiPlan 500 is \$149)

INTRODUCING A NEW DIMENSION IN MANAGEMENT DATABASE SYSTEMS

NOW EXTEND YOUR REACH

Superbase Professional is the most advanced database ever produced for the Amiga.TM It is a technical and commercial breakthrough allowing you to advance your database expectations beyond those of any existing system. Whatever the database application, Superbase Professional has the power to achieve it.

The Graphics Application Generator.

The Superbase Professional Forms Editor is a unique graphic design tool used to create forms using colors, patterns, lines, boxes, text fonts and graphic images...and then use them for custom applications. Superbase forms can relate to multiple files. They possess the intelligence to generate linked records, then retrieve and display them automatically without any programming. It is the ideal developers tool.

Total text integration.

An integral text editor allows a mail merge interface to the database and the ability to link text files to records. Superbase Professional can search any text file, even if it wasn't created by Superbase.

As easy to use as a VCR.
All the ease-of-use benefits of Superbase Personal – video style control panel, pull-down menus, pop-up requestors – still apply.

Professional back-up.

All registered users of Superbase Professional qualify to use the Official Superbase Information Network, and for application to become Official Superbase Application Developers. Approved developers receive newsletters, regular technical notes and updates, automatic upgrades, run time shell licenses and access to PROFORUM, our on-line high level technical support service.

Minimum System Requirements.
Version 1.2 system software.
1 floppy disk drive. 512K RAM (1 megabyte recommended).

Price: \$299.95

SuperbaseTM

PROFESSIONAL

PROGRESSIVE
PERIPHERALS
& SOFTWARE

For your nearest dealer write or call the exclusive distributor
464 Kalamath Street, Denver Colorado 80204 Phone: (303) 825-4144,
Fax: (303) 893-6938, Telex: 888837



Precision Software AmigaTM is the trade mark of Commodore-Amiga Inc.

Circle 159 on Reader Service card

marking cells on the spreadsheet, the handy scroll bars and other niceties give it an Amiga feel.

Analyze! is a good, middle-of-the-road package. While not as powerful as Logistix or MaxiPlan Plus, it offers a solid set of capabilities and a nice combination of the 1-2-3 and Amiga user interfaces.

MAXIPLAN PLUS

MaxiPlan Plus, now from Oxxi, is the newest incarnation of the MaxiPlan product that was once marketed by MaxiSoft. It is a dramatic improvement over previous versions. As we mentioned earlier, Oxxi states that MaxiPlan Plus requires 1MB of memory (although we were able to use it on small worksheets in 512K). The company does, however, offer a version specifically for a 512K Amiga—MaxiPlan 500—which omits a few capabilities (notably macros) and is \$50 cheaper.

Like Logistix, MaxiPlan Plus is chock full of features. The approximately 300-page manual is well-written, complete and contains many useful tutorials. It offers over 70 functions, including all of the standard arithmetic, trig and finan-

cial ones. You can import 1-2-3 files with a utility that is included. It has a powerful macro language. You can produce a variety of graphs, including many types of bar and pie charts, scatter charts and line graphs, with the area beneath the line shaded or not. One particularly nice touch is the ability to store or retrieve your charts in IFF files that many other Amiga programs can then manipulate.

This ability is indicative of where MaxiPlan Plus really shines: It is integrated into the Amiga environment far better than any of the other products. It abandons any real degree of 1-2-3 compatibility and works beautifully with the standard Amiga desktop model. You gain access to commands from pull-down menus, move around the spreadsheet and mark areas with the mouse, and use scroll bars to see other parts of the worksheet. You can even enter formulas by using the mouse to point to the appropriate symbols.

Also, although you may at first wonder why, it talks. It can repeat your formulas or your keystrokes as you type them. Perhaps more usefully, it can read back to you sections of a worksheet, so that you

can check your data entry without looking up from the original sheet of paper.

If you don't care about being compatible with 1-2-3 and want a product that works well with the Amiga, this is probably your best bet. Its only real drawback is performance; while still useable, it is definitely the slowest of the bunch.

OUR PICKS

For maximum power, buy either Logistix or MaxiPlan Plus. If you need the 1-2-3 feel, go for Logistix; MaxiPlan Plus is the obvious choice for the hardcore Amiga user who needs a lot of functions. Halcac can also give you the Amiga look and feel, but only if you can live with its minimal capabilities. Analyze! is a reasonable blend of the two user interfaces, but is not quite as powerful as Logistix or MaxiPlan Plus. Whatever your choice, we think that you will find, as we have, that powerful spreadsheets for the Amiga are here today. ■

Mark Van Name and Bill Catchings are contributing editors to AmigaWorld. Write to them at 10024 Sycamore Road, Durham, NC 27703.

Over 700 Different Amiga™ Items In Stock!

You've Tried The Other's, Now Buy From The Best! Computer Discount,
"your one stop Amiga™ shop"

- * Authorized Amiga™ Dealer
- * FREE catalog with over 700 items including full descriptions.
- * We carry all new Amiga Titles!
- * Orders shipped in 24 hours
- * 15 day money back guarantee
- * Knowledgeable people, professional service
- * Largest inventory of Amiga products
- * Credit cards are never charged until the goods are shipped!
- * Overnight delivery available

For your free catalog, Call today! (303) 825-2943

Computer Discount
Mail Orders Only, Call: 303-825-2943
998 West 5th Avenue
Denver, Colorado 80204

Visit our new Phoenix and Australia Locations!

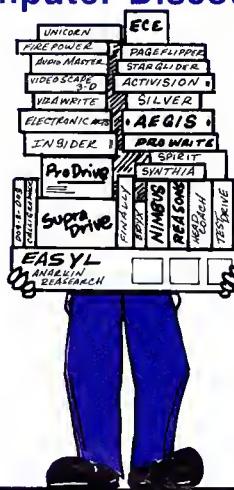
Computer Discount of Arizona
834 East Indian School Road
Phoenix, Arizona 85014
602-274-9599

Computer Discount of Australia
8/5 Greenwich Road
St. Leonards, NSW
Australia, 2065
(02)-436-2976

Circle reader#137
Amiga is a trademark of Commodore-Amiga, Inc.

Call for Supra Hard Drive Specials

Visit Our New Store in Phoenix, Arizona!



**Computer
Discount**

"your one stop Amiga™ shop"

SOURCE LEVEL DEBUGGER

Announcing the Manx Aztec C Source Level Debugger for the Amiga!

NOW THE MOST ADVANCED COMPUTER IN THE WORLD HAS THE MOST ADVANCED SOURCE LEVEL DEBUGGER IN THE WORLD:

Manx Aztec SDB.

Save Time and Effort

If you're a pro at working with low level Amiga debuggers, you'll recognize what a source level debugger can mean—*time savings*. Time you'd rather spend *creating* than debugging. And if you're a beginner, *SDB* will make you a pro in no time.

Outstanding Features

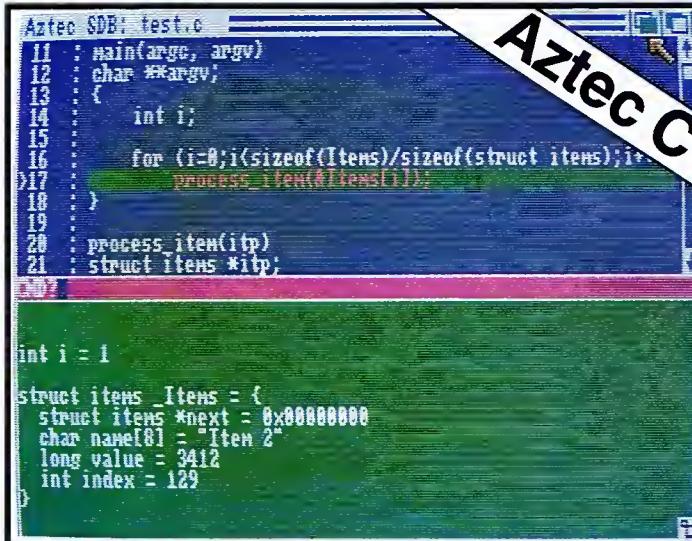
That's why our new windowed *SDB* is so spectacular—because it's full of exciting features that make debugging a breeze. Of course, *SDB* has all of the features you expect from a debugger—like line-by-line tracing. Conditional breakpoints on lines, functions, or variables. Examination, modification, and display of global, local, and static variables, structures or expressions by name.

But *SDB* is also full of unexpected, incredibly sophisticated features. There's reusable command macros and procedures. Back tracing. Active frame context switching—just to name a few. Wait till you see *SDB* in action—it will blow you away!

Our Commitment to You

Manx Software Systems is the leading edge in C development systems. That means continual updates that bring the best to you.

Experience version 3.6 of Aztec C68k/Am today. And enjoy the most advanced debugger available ... on any computer.



- View your C Source
 - Enter commands
 - View your command output ...
- ...all at the same time!*

AZTEC C VERSIONS TO SUIT YOUR NEEDS:

Aztec C68K/Am-p Professional System \$199

Includes all of the Standard Features

Aztec C68K/Am-d Developer System \$299

Includes all of the Standard and Extended Features

Source Level Debugger \$75

Library Source \$300

Standard Features of Aztec C68k/Am 3.6:

- optimized C with selectable 68020 and 68881 support
- 680x0 Macro Assembler with 68881 support
- linker/librarian with overlays, scatter load, and segmentation
- symbolic debugger
- supports Amiga object format
- UNIX, AMIGA, and general purpose run time routines
- runs under CLI and supports all Workbench functions
- creates CLI and Workbench applications
- Supports both 1.1 and 1.2 Amiga DOS
- 600 pages of documentation and great example programs

Extended Features of Aztec C68k/Am 3.6

- UNIX utilities make, diff, grep, obj, ord, and vi
- special math support libraries for 68881 and Manx IEEE emulation

Portability: Aztec C is also available for the Macintosh, Apple II, MS-DOS/PC-DOS, CP/M-86, TRS-80, ROM, and others. Aztec C68k Third Party Software: A large array of support software is available for Aztec C68k. Call or write for information. The following is a list of the most requested products: Power Windows • Amiga View • Key to C • Amiga Lint • Metascope. Immediate Delivery Available for Most Destinations. Aztec C is available on a thirty day money-back guarantee. C.O.D., VISA, American Express, MasterCard, wire (domestic and international), and terms are available.

Order Now At No Risk Or Call For Information

1-800-221-0440

In NJ or outside the USA call: 201-542-2121
Telex: 4995812MANX Fax: 201-542-8386

MANX

SEE FOR YOURSELF WHAT ALL THE FUSS IS ABOUT ...

Order our Manx Aztec C68k/Am with 30-day satisfaction guarantee. We're convinced that once you see *SDB* at work, no other debugger will ever be good enough again. But if you don't believe us—try us! We're offering an *SDB* Demonstration Disk for just \$5. Simply call 1-800-221-0440 (NJ call 201-542-2121) and order your copy of Aztec C or your Demo Disk today.

Circle 31 on Reader Service card.

BASIC By The Numbers

Part II of our tutorial on Amiga Basic programming will send you for a loop!

By Bob Ryan

9

GO WITH THE FLOW

COMPUTER PROGRAMS execute one line at a time, one line after another. This top-to-bottom execution of program lines is called the flow of control of the program; the line currently executing is thought of as controlling the computer. When a line finishes executing, it passes

control to the next line in the program—most of the time.

The following program shows how program control passes from one line to the next. Enter it into your computer and run it.

```
PRINT "Line 1 is in control"  
PRINT "Now line 2 . . ."
```

```
PRINT "Then 3 . . ."  
PRINT "And 4"  
PRINT "And finally 5"  
END
```

This simple program demonstrates how a program steps through a listing, executing one line at a time, one line after another.

10

LOOPING MANIA

LET'S SAY YOU had to write a program that adds a pair of numbers input from the keyboard and prints the result. It is not a very difficult program, a couple of INPUT statements and a PRINT statement does the trick (see section 6 of last month's column, p. 22). Now suppose you have to write a program that will add ten pairs of numbers input from the keyboard and print the sums of each pair. Do you need twenty INPUT statements and ten PRINT statements? Suddenly, writing programs that deal with thousands of numbers looks like a lot of repetitious work.

Luckily, you can let the program do the repetitious work by getting it to reuse program statements. You do this by changing the normal flow of control of a program. The simplest way to change the flow of control is with the GOTO statement. Try the following program:

REM Loop Demo

StartLoop:

```
INPUT "X";x  
INPUT "Y";y  
PRINT x + y
```

GOTO StartLoop

END

Without the GOTO statement, this program would get two numbers from the keyboard, print the results in the output window and end. The GOTO statement, however, changes the normal top-down flow of control by sending control back up to StartLoop. Once at StartLoop, the program executes the program lines one after another until it gets to the GOTO once again and jumps back up to StartLoop. The program never gets to the END statement. You may be wondering what StartLoop does. The answer is nothing. StartLoop is a label; it gives the GOTO statement a place to go to. (I made up the name StartLoop.) Many versions of BASIC require that every pro-

gram line be preceded by a line number that acts as a label to that line. With Amiga Basic, you need label only those lines that you have to jump to at some point.

The StartLoop label and the GOTO statement mark the beginning and end of a control structure, a block of statements that change the normal

flow of control in a program. As its name implies, StartLoop marks the beginning of a loop structure where program control flows to the bottom only to loop back to the top. In fact, StartLoop begins an infinite loop—there is no way to get out of the loop from inside the program.

11

DECISIONS, DECISIONS

YOU DO NOT find too many instances where an infinite loop is a useful thing to have in a program. Much more useful are control structures where you determine how many times the program goes through a loop and under what conditions the program exits the loop. Such structures are common in Amiga Basic programs because of the ability of programs to make decisions.

Using the program from the preceding section, substitute the GOTO statement with IF y <> 999 GOTO StartLoop and run the program. It will run as before until you get to the IF...GOTO statement. This statement tests the last number you entered for the y variable. If the number does not equal 999, then the program loops to StartLoop. If y does equal 999, the program falls through to the END statement. IF...GOTO statements let programs make decisions.

The IF...GOTO statement is a specific form of the IF...THEN statement. ►

You use IF...THEN statements to choose between two courses of action. An IF...THEN statement has two parts. The "IF" part sets up a test. In our case, the program tests to see if the value of the y variable is not equal to the number 999. If the result of the test is true—y is not equal to 999—the "THEN" part of the statement is executed. If the result is false—y is not not equal to 999 (in other words, y is equal to 999)—control passes to the statement following the IF...THEN statement.

The "IF" part of an IF...THEN consists of a Boolean expression, meaning that the expression must be either true or false—no fine shades of distinction in the computer world. The expression can test for more than one condition, but the result must be true or false. For example, we could have tested both the x and y variables for 999 with the following statement:

```
IF (x <> 999) AND (y <> 999) THEN StartLoop
```

In this case, if both x and y are not equal to 999, the expression is true and the program jumps to the StartLoop label. If either of the variables equals 999, the expression is false and control proceeds to the next line of the program. We have barely touched upon the wealth of options available with the IF...THEN statement. For instance, instead of just moving to the next program line in the event of a false result, you can specify an ELSE clause to execute when the conditional expression is false. Also, the THEN (true) and ELSE (false) clauses do not have to be single statements; they can consist of blocks of statements. In addition, you can nest IF...THEN statements inside the THEN and ELSE blocks of another IF...THEN statement. The possibilities are detailed in the Amiga Basic manual, but to see if you get the idea, examine the following listing and try to determine the output you would get if you entered and ran the program.

```
REM IF...THEN Quiz
```

```
num1 = 5
num2 = 7
num3 = 10
```

```
IF num1 + num2 = num3 THEN Label.1
```

```
IF num1 + num2 = num3 THEN
  PRINT "Once upon a time"
  IF 2 * num1 = num2 THEN
    PRINT "there was a little program"
  ELSE
    PRINT "there was a control structure"
  END IF
  PRINT "that was quite complicated"
ELSE
  IF num3 - 3 = num2 THEN
    PRINT "and no one could understand it"
    PRINT "so it looped forever"
  ELSE
    PRINT "but it certainly served a purpose"
  END IF
ENDIF
Label.1:
IF num3 = (2 * (num2 - num1)) THEN
  PRINT "but because of complications"
  PRINT "it never found the END"
ELSE
  IF num3 = (num1 * num2) - 15 THEN
    PRINT "when it met an untimely end"
  ELSE
    PRINT "but you could figure it out"
  END IF
ENDIF
PRINT "If you thought like a computer."
END
```

The output of this program is printed at the end of this article.

12 WE R IN CONTROL

AMIGA BASIC HAS two primary loop structures; FOR...NEXT loops and WHILE...WEND loops. You use FOR...NEXT when you know, or can calculate in the program, how many times you will have to go through the loop. FOR...NEXT loops are used primarily to access data stored in arrays. (More on arrays next month.) You use WHILE...WEND loops when you are not sure how many times you will have to go through the loop. WHILE...WEND loops are the general-purpose Amiga Basic loops.

All the work in a FOR...NEXT loop is done in the FOR statement, which

looks like this—FOR x = 1 TO 1000. The x (which can be any variable) is assigned the first value (1 in this case, but you could use any constant, variable or expression). The value after the TO is the ending condition. The loop works by executing the statement or statements between the FOR statement and its corresponding NEXT statement until the value of x equals 1000. Here is a FOR...NEXT loop at work:

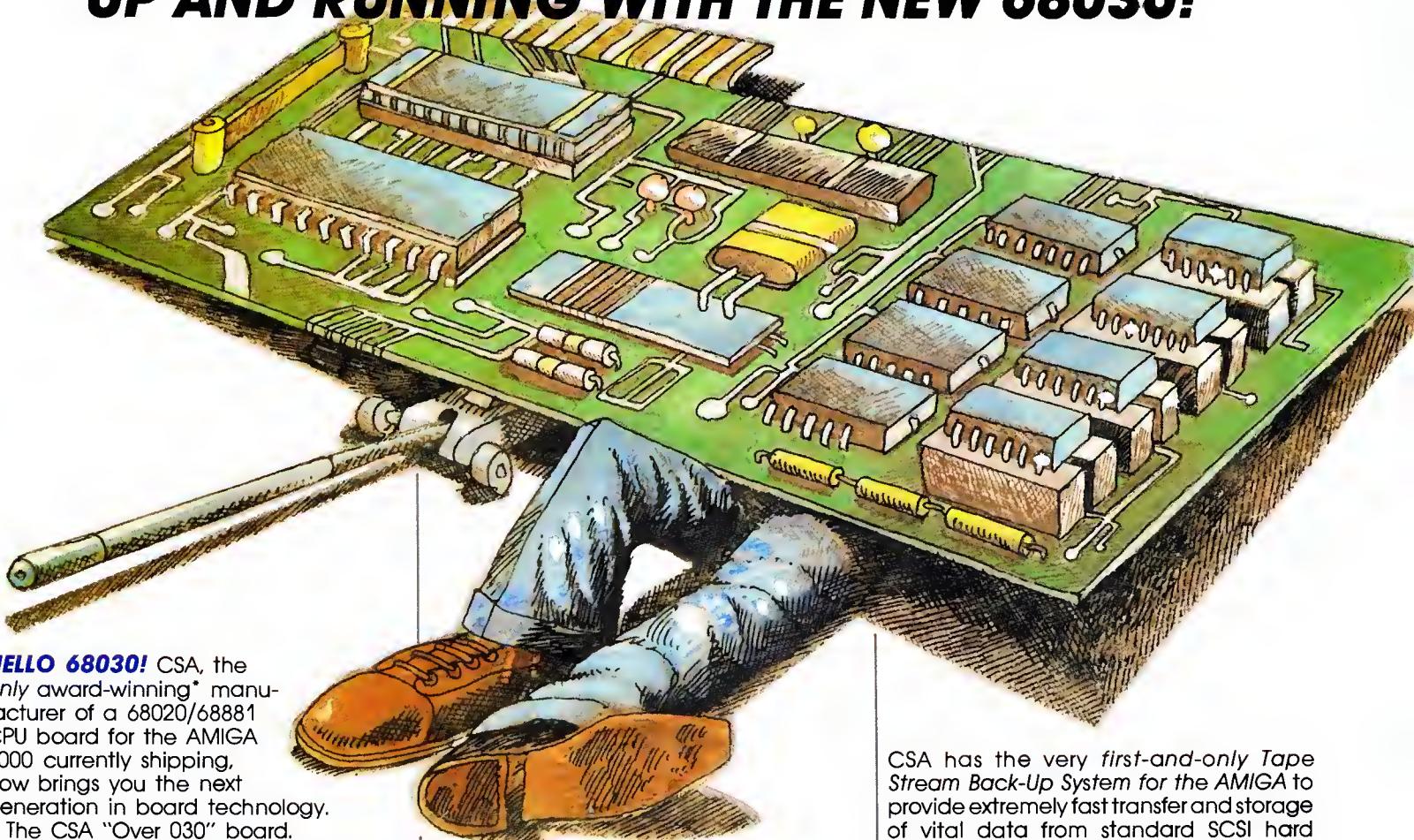
```
FOR Z = 5 TO 25
  squareZ = Z * Z
  PRINT Z,squareZ
NEXT Z
END
```

This program prints all the numbers and their squares be-

tween 5 and 25, inclusive. Z starts with a value of 5. Each time the loop gets to the NEXT statement, the value of Z is incremented by 1 and the program jumps to the FOR statement. Here the program tests to see if Z is equal to 25. If it is, the program executes the statement in the loop one last time and then continues with the statement following the NEXT statement. If Z is not yet equal to 25, the program jumps to the FOR statement again.

WHILE...WEND loops also set up an ending condition at the top of the loop, but the condition can be more general than in FOR...NEXT loops. Here are some exam- ►

WHILE THE OTHER GUYS ARE STILL TINKERING WITH THEIR 68020 BOARDS, CSA IS ALREADY UP AND RUNNING WITH THE NEW 68030!



HELLO 68030! CSA, the only award-winning* manufacturer of a 68020/68881 CPU board for the AMIGA 2000 currently shipping, now brings you the next generation in board technology.

The CSA "Over 030" board.

Sporting the new 68030 32-bit processor with onboard memory management, and 68882 math co-processor, Motorola reports that its new line of microprocessors are up to 4 times as fast as the 68020/68881 combination.

So, while the other guys are still promising 68020 boards for the AMIGA 2000 CPU slot, CSA is gearing up to begin shipping the new "Over 030" board next month after the initial debut at the CEBIT Hannover Computer Fair in Germany. And we're already shipping the new 68882 math co-processor as an option for our current line of 68020 boards today.

THE BEGINNING:

To begin with, we know the 68020 and

68030 can access up to 4 gigabytes of RAM, and that you'll eventually need more memory expansion capability for running UNIX (when available), image processing, animation, CAD/CAM, and other "RAM Hungry" applications.

So CSA's advanced technology now brings you up to 32MB of 32-bit low cost dynamic RAM on a single board.

By the way, the other guys only give you up to 2MB of RAM on their boards, and that's all you get . . . forever.

THE MIDDLE:

In the middle of all this, we know that you'll need a way to protect your important programs from possible loss or damage. So

CSA has the very *first-and-only* Tape Stream Back-Up System for the AMIGA to provide extremely fast transfer and storage of vital data from standard SCSI hard drives, as well as the *first-and-only* 800MB WORM (Write Once, Read Many) Optic Disk Drive originally developed for the SDI "Star Wars" Program.

THE END:

All the new guys on the block are claiming they're "blowing us away" with superior boards . . . but in the end CSA is *still* the only one with independent benchmarks that show *superior performance* to the Macintosh II, VAX 8800, and Sun 3/160 Workstation.

The choice is *still* yours.

You can either wait for "vaporware" from the other guys, or you can call CSA for the real McCoy today.

CSA. We ship products, not promises.

The Technological Leader Stays 1-Step Ahead . . .



Computer System Associates, Inc.
7564 Trade Street, San Diego, CA 92121
(619) 566-3911 • TELEX 333-693

*Voted the Best Hardware Manufacturer for the AMIGA in 1986 and 1987. AMIGA is the trademark of Commodore Business Machines. Macintosh is the trademark of Apple Computer, Inc. VAX is the trademark of Digital Equipment Corporation.

ples of WHILE statements:

```
WHILE x = 5
WHILE name$ = "BOB"
WHILE counter <> highend
WHILE NOT EOF(1)
WHILE total > 1000
```

A WHILE...WEND loop executes the statements between the WHILE and WEND statements until the condition set up in the WHILE statement is

false. The program then continues execution on the line following the WEND statement. Here is a WHILE...WEND loop at work:

```
Counter = 0
Number = 1
WHILE NumSquared < 1000
  NumSquared = Number * Number
  Counter = Counter + 1
```

```
Number = Number + 1
WEND
PRINT "The number of perfect
  squares under 1000 is ";Counter
END
```

This program counts the number of perfect squares among the numbers from 1 to 1000 by counting the number of times the WHILE...WEND loop is executed. (The statement Counter = Counter + 1

is a standard way to count things in programming.) The condition for continuing the loop is if the square of the current number is less than 1000. When this condition is false, the loop ends. Note that if the condition is false when the program first hits the WHILE...WEND loop, the statements inside the loop will never execute.

13

GETTING DOWN TO CASES

BOTH TRUE BASIC and the Absoft AC/BASIC Compiler have more control and looping structures than Amiga Basic. True BASIC has structures called DO loops that check for an ending condition both at the beginning of the loop (a DO...WHILE loop) and at the bottom of the loop (the DO...UNTIL loop). You can even attach conditions to the top and bottom of the same loop. Here's an example of a DO loop that checks for the ending condition at the bottom of a loop:

```
REM True BASIC loop
PRINT "Input a number between 1
  and 10"
DO
  INPUT x
LOOP UNTIL (x >= 1)
  AND (x <= 10)
END
```

This program will loop until the user inputs a number that is greater than or equal to 1 and is less than or equal to 10. The point of a loop that checks the ending condition at the bottom rather than the top is that the loop is always executed at least once. Because it offers a choice between checking conditions

at the bottom as well as the top of a loop, True BASIC is more flexible than Amiga Basic regarding control structures.

Both True BASIC and the AC/BASIC compiler support the SELECT CASE statement. Let's suppose you have a program that allows the user to perform one of four arithmetic functions on two numbers. You would first have the user input the numbers; then, you would have him indicate the operation you wanted to perform. You could either test for the operation with a series of IF...THEN statements, or you could use the SELECT CASE statement. Here's how the program might look:

```
REM SELECT CASE for
REM True BASIC and
REM AC/BASIC
INPUT "Number 1 "; x
INPUT "Number 2 "; y
Label.1:
PRINT "Enter the operation:
  + - * / "
INPUT op$
SELECT CASE op$
CASE "+"
  PRINT x + y
```

```
CASE "-"
  PRINT x - y
CASE "*"
  PRINT x * y
CASE "/"
  PRINT x / y
CASE ELSE Label.1
END SELECT
END
```

The program matches the value of the variable in the SELECT CASE statement with the values of the expressions following the individual CASE statements. When the two match, the statement or block of statements following the CASE statement are executed. The CASE ELSE statement is a catch-all just in case none of the other CASEs fit. In the example, the CASE ELSE returns to the INPUT statement because the user obviously did not enter one of the allowed operators.

Although you can simulate the CASE SELECT statement and DO...UNTIL in Amiga Basic, it is not the same as having them built into the language. If you find the structures built into Amiga Basic too limiting, you can always move up to True BASIC or AC/BASIC.

14

IN THE PIPELINE

NEXT MONTH I'll talk more about variables and arrays, and begin examining the Amiga Basic graphics commands. The output from the IF...THEN quiz program is as follows:
Once upon a time

there was a control structure
that was quite complicated
but you could figure it out
If you thought like a computer.
Did you get the same results? If
you didn't, enter the listing and
step through it. Nested

IF...THEN statements are powerful, but they can also be very tricky.

Send your questions and comments to Basic By The Numbers, AmigaWorld, 80 Elm St., Peterborough, NH 03458. ■

City Desk

The Critics Choice For Amiga Desktop Publishing

"...the best Desktop Publishing Package for the Amiga." Guy Wright, Editor, AmigaWorld, 12-87.

"...a surprising amount of power for the price." Ted Drude, Computer Shopper, 11-87.

"...most end users will find City Desk can handle all they'll ever need." Gary Fields, Commodore Magazine, 1-88.

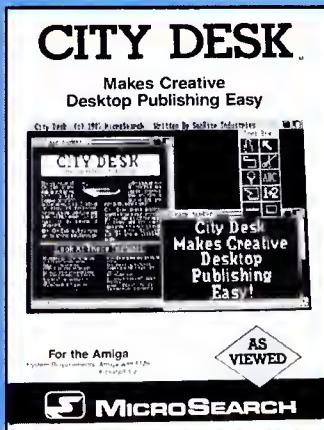
"...a step forward in Amiga Desktop Publishing software," Ted Drude, Computer Shopper, 11-87.

"Simple enough to satisfy the needs of the casual or beginning user, City Desk has all the power, controls, flexibility, and laser capability that a serious user will want, sooner or later." "...in many ways, the most powerful and flexible publishing program to yet hit the Amiga market." Gary Ludwick, AmigaWorld, 12-87.

Version 1.1 Now Shipping!

City Desk is a full featured Desktop Publishing Program designed with both the professional and amateur in mind. Now you have the power and flexibility to create high quality, professional looking documents. City Desk is for the serious users who demand the best, in products and results.

\$149.95 US



- Supports PostScript
- Supports HP LaserJet+
- Supports WordPerfect
- 140 Page manual created with City Desk
- Simple start up exercise
- Automatic kerning and leading
- Powerful embedded command options
- Unlimited font changes in the text
- Flow text around graphics
- Any number of fonts on a line
- All preferences printers supported

- Prints IFF pictures
- Prints color pictures in gray scales
- Text and graphic editors included
- Headers or Footers
- Automatic page numbering
- Line ruling with variable line weights
- Widow and orphan control
- Indents and outdents
- Left, right, center, or fill justification
- Reverse type and graphics
- Not copy protected!

(This page was created with City Desk and a PostScript Printer.)

Perfect Sound Digitizer

A2000/A500 Version Now Shipping!

A true stereo digitizer for your Amiga. Record any sound in mono or stereo, then use the Perfect Sound editor to modify the sound. Includes the "C" source code.
\$89.95 US

"... This digitizer is fun and quite addictive! I highly recommend the PERFECT SOUND digitizer!" -- Ron Battle, Amazing Computing, Volume 2, #5

City Desk Art Companion 1

200 medium resolution images for use as clipart in desktop publishing programs, such as City Desk. All pictures were created in 640 X 200 resolution and are in IFF format.

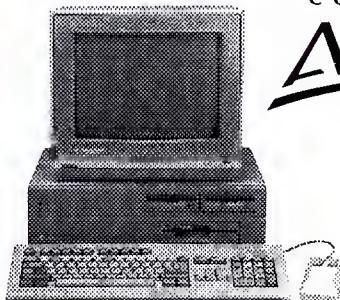
\$29.95 US



MICROSEARCH
9896 Southwest Freeway, Houston, TX 77074 (713) 988-2818

GO AMIGO!™

THE WORLD'S LARGEST DISTRIBUTOR OF AMIGA™ PRODUCTS



ELECTRONIC ARTS

Adventure Construction Kit	\$ 19
Alternate Reality	\$ 29
Archon	\$ 19
Archon II	\$ 19
Arctic Fox	\$ 26
Arts Part II	\$ 19
Bard's Tale	\$ 32
Black Cauldron	\$ 29
ChessMaster 2000	\$ 30
Deluxe Music	\$ 63
Deluxe Paint II	\$ 84
Deluxe Paint Utility	\$ 19
Deluxe Print II	\$ 58
Deluxe Productions	\$144
Deluxe Video 1.2	\$ 84
Donald Duck	\$ 19
DPrint Data Disk	\$ 25
Earl Weaver Baseball	\$ 35
Empire	\$36
Ferrari Formula 1	\$ 36
Financial Cookbook	\$ 19
Golden Oldies	\$ 19
Gridiron	\$ 44
Hot & Cool Jazz Disk	\$ 24
Instant Music	\$ 32
Instant Music Data	\$ 25
Intellitype	\$ 35
King's Quest 1,2,3	Call
Lounge Lizards	\$ 38
Mad Libs	\$ 16
Marble Madness	\$ 32
Mavis Beacon Teaches Typing	\$ 33
New Tech. Coloring Book	\$ 17
One on One	\$ 19
DuiZam	\$ 25
Reach for the Stars	\$ 33
Seasons & Holidays	\$ 23
Seven Cities of Gold	\$ 19
Skyfox	\$ 19
Space Quest II	\$ 37
Starfleet I	\$ 36
Thexder	\$ 26
Winnie the Pooh	\$ 26

ONLY FROM GO AMIGO:

GET A **FREE DATA DISK**
WITH THE PURCHASE OF
ANY DELUXE PRODUCT!
(\$29 VALUE!!!)

FREE WITH GRIDIRON

Your Choice of:

- One on One
- Fin. Cookbook • Skyfox
- Adventure Construction
(All Compatible with A500!)

**HAPPY NEW YEAR FROM GO AMIGO AND
ELECTRONIC ARTS!**

ProWrite

\$75

DigiView
2.0

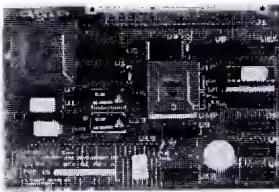
\$146

ImaGen

\$157

HURRICANE!

- 14MHz Accelerator for A500/A1000/A2000
- 16MHz 68881 Co-Processor Standard
- 4-8 Times Speed Improvement
- Full Software Compatibility
- 2MB 32-Bit RAM Avail.
- Easy to Install And Very Affordable

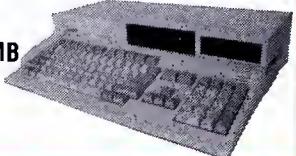


Call us for info
on DMA SCSI
Controller

FINAL

ESCORT System 500

- 2MB RAM Board • Passes The Bus
- Has Own Power Supply
- Optional 20/40MB Hard Disk
- Optional 2nd 3.5" Floppy



Hard Frame
Drive
for A2000

CALL

Escort 2
2MB

\$499

HUGE INVENTORY – FAST SHIPPING!

LARGEST SELECTION - BEST PRICES!

SOFTWARE

ABSOFT	
AC/Basic.....	\$139
AC/Fortran.....	\$199
ACCESS SOFTWARE	
Leader Board.....	\$ 27
Tournament Disk.....	\$ 14
ACCOLADE	
Mean 18.....	\$ 27
Famous Courses Vol.2.....	\$ 17
Night Flight.....	Call
Hard Ball.....	Call
Test Drive.....	\$ 31
ACS	
Brush Works (1 or 2)....	\$ 24
EFX.....	\$225
Grade Manager.....	\$ 69
Music Student.....	Call
Duckmerge.....	\$ 44
DuizMaster.....	Call
Station Manager.....	Call
ACTIVISION	
Beyond Zork.....	\$ 35
Game★Basketball.....	\$ 29
Game★Baseball.....	\$ 29
Game★Golf.....	\$ 29
Game★Football.....	\$ 29
GB Air Rally.....	\$ 28
Infocom Titles!!.....	Call
Little Comp. People.....	Call
Lurking Horror.....	\$ 29
Music Studio.....	\$ 38
Portal.....	\$ 29
Shanghai.....	\$ 29
ToneTown.....	\$ 29
AODISON-WESLEY	
Hardware Manual.....	Call
Intuition Manual.....	Call
Rom Kernel Manual.....	Call
Rom Exec Manual.....	Call
AEGIS	
Animator/Images.....	\$ 84
Art Disk.....	\$ 24
Arazok's Tomb.....	\$ 32
Audiometer.....	\$ 43
Diga.....	\$ 56
Draw Plus.....	\$149
Images.....	\$ 26
Impact.....	\$ 54
Sonic.....	\$ 49
Videoscape 3D.....	\$129
Video Titter.....	Call
AMIGA	
MindWalker.....	\$ 38
1.2 Update.....	\$ 14
ARTWORK	
Bridge 5.0.....	Call
Linkword Languages.....	\$ 24
Strip Poker.....	\$ 32
Strip Pokr Data Disk #4.....	\$ 15
ASOG	
FACC II.....	\$ 27
BANTAM	
AmigaDDS Express.....	\$ 25
DDS Manuals.....	\$ 22
BAUOVILLE	
Award Maker.....	\$ 39
Video Vegas.....	\$ 29
B.E.S.T.	
Business Mgmt.....	\$319
BROWN WAGH	
Publisher+.....	Call
TV Show.....	\$ 74
TV Text.....	\$ 69
Zuma Fonts (Each).....	\$ 26
BYTE BY BYTE	
Animate 3-D.....	Call
InfoVinder.....	\$ 69
Sculpt 3-D.....	Call
CAPILANO	
Logic Works.....	Call
CENTRAL COAST	
DISK 2 DISK.....	In Stock!
DOS 2 DDS.....	\$ 39
Precisely.....	\$ 64
Quarterback.....	\$ 54

COMMAND SIMULATIONS	
New! Blitzkrieg.....	Call
COMPUEMO	
Hacker Package.....	\$ 34
Mirror.....	\$ 34
COSMI	
Super Huey.....	\$ 26
CREATIVE SOLUTIONS	
Multiforth.....	Call
CRYSTAL ROSE	
Analytic Art.....	\$ 44
DELTA RESEARCH	
J-Forth.....	\$ 89
DIGITAL CREATIONS	
D'Buddy.....	\$ 58
Digital Link.....	\$ 49
Gizmos 2.0.....	Call
DIGITAL SOLUTIONS	
LPD Series.....	Call
LPD Writer.....	In Stock!
DISCOVERY	
Amnix.....	Call
Arkanoid.....	Call
DX Series.....	Call
Grabbit.....	\$ 24
Marauder II.....	\$ 25
EAGLE TREE	
Butcher 2.0.....	\$ 25
EPYX	
California Games.....	\$ 29
Destroyer.....	\$ 29
Rogue.....	\$ 25
Sub Battle.....	\$ 29
Summer Games.....	\$ 25
Temple of Apshai.....	\$ 25
World Games.....	\$ 25
FELINA	
A-Talk Plus.....	\$ 79
FINALLY TECHNOLOGIES	
New! Animation.....	\$ 74
Dr. Xes.....	\$ 37
Nancy.....	\$ 45
Phasar.....	\$ 61
Senior Tutor.....	Call
Talker.....	\$ 46
FIREBIRD	
Guild of Thieves.....	\$ 32
Golden Path.....	\$ 35
Jewel of Darkness.....	\$ 25
Knight Drc.....	\$ 34
Pawn.....	\$ 32
Silicon Dreams.....	\$ 25
New! StarGlider.....	Call
FIRST BYTE	
First Letters & Words.....	\$ 36
First Shapes.....	Call
Kid Talk.....	Call
Math Talk.....	Call
Math Talk Fractions.....	Call
Smoothtalker.....	\$ 36
Speller Bee.....	Call
FUTUREWORKS	
LexCheck.....	\$ 34
GIMP	
Lint.....	\$ 85
GOLD DISK	
New! Color Separator.....	Call
New! Comic Setter.....	\$ 74
Font Set 1.....	\$ 26
Gold Spell.....	\$ 34
Laser Script.....	\$ 35
Page Setter.....	\$ 94
Prol. Page Setter.....	Call
HAITEX	
HiCalc.....	\$ 44
HASH	
Animator Apprentice.....	Call
Animator Apprnt. Jr.....	Call
IMPULSE	
Prism.....	\$ 49
New! Silver.....	\$119
INFINITY	
Galileo.....	\$ 49
New! Galileo II.....	Call
Grand Slam Tennis.....	\$ 38
Hot Licks.....	\$ 37
Shakespeare.....	Call
INOVATRONICS	
Power Windows.....	\$ 65
New! Works.....	Call

INTELLIGENT MEMORY	
New! Emmetic Skinner.....	\$ 27
New! Galaxy Fight.....	\$ 35
New! Garrison.....	Call
New! Mousetrap.....	\$ 22
New! Witchcraft.....	\$ 35
INTERACTIVE SOFTWARES	
Calligrapher.....	\$ 79
Newsletter Fonts.....	\$ 25
Studio Fonts.....	\$ 25
ISM	
Surgeon.....	\$ 39
JAGWARE	
Alien Fires.....	Call
JDK IMAGES	
Pro Video CGI.....	Call
Font Library 1.....	\$ 79
Font Library 2.....	\$ 79
JENDAY	
Conv. w/ Comp.....	\$ 24
JHM	
Talking Color Book.....	\$ 24
LATTICE	
C - Regular.....	\$163
C - Professional.....	\$284
dBC III Library.....	\$119
Other Products.....	Call
LIGHTNING SOFTWARE	
Big Picture.....	Call
LION'S AMIGA ART STUDIO	
New! Font Sets 1 & 2.....	\$ 25
New! Newsletter Fonts.....	\$ 25
MANX	
Aztec C - Comm.....	\$315
Aztec C - Devel.....	\$199
Aztec C - ProL....	\$149
Source Level Debug'r....	\$ 56
MERIDIEN SOFTWARE	
Zing.....	\$ 49
Zing Keys.....	\$ 36
Zing Spell.....	\$ 38
METACOMCO	
Assembler.....	Call
Lisp.....	\$154
Make.....	\$ 57
Pascal.....	\$ 68
Shell.....	\$ 45
Toolkit.....	\$ 35
METADIGM	
MetaScope.....	\$ 79
MICHTRON	
Air Ball.....	\$ 28
Cashman.....	\$ 24
Gold Runner.....	\$ 28
Karate Kid II.....	\$ 28
Time Bandits.....	\$ 28
MICRO ILLUSIONS	
Black Jack Academy.....	\$ 29
CAD System.....	Call
Dynamic Word.....	\$139
Discovery.....	\$ 25
Fairy Tale Adv.....	In Stock!
Fire Power.....	\$ 19
Galactic Invasion.....	\$ 19
Land of Legends.....	\$ 37
Music X.....	\$219
Photon Video.....	Call
Planetary.....	\$ 51
Romantic Encounter.....	\$ 29
Turbo.....	\$ 19
MICRO MAGIC	
Forms in Flight.....	\$ 69
MICROPROSE	
Gunship.....	\$ 28
Silent Service.....	\$ 24
MICROSEARCH	
City Desk.....	\$ 110
Desktop Artist #1.....	\$ 23
Head Coach.....	\$ 39
MICROSIMTHS	
Fast Fonts.....	Call
TXEd.....	\$ 32
MICROSYSTEMS SW	
Analyze 2.0.....	\$ 74
BBS-PC.....	\$ 62
Flipside.....	\$ 31
On-line.....	\$ 42
Organize.....	\$ 63
Scribble.....	\$ 61
New! Works.....	\$144

MIMETICS	
Soundscape Pro Midi.....	\$130
MINDSCAPE	
Balance of Power.....	\$ 31
Bratacus.....	\$ 32
Defender of Crown.....	\$ 31
Deja Vu.....	\$ 32
New! Gauntlet.....	Call
Halley Project.....	\$ 30
New! Indoor Sports.....	\$ 35
New! Into Eagle's Nest.....	Call
Keyboard Cadet.....	Call
King of Chicago.....	\$ 34
Plutos.....	Call
Racter.....	\$ 28
SAT Preparation.....	\$ 52
S.D.I.....	\$ 31
Shadowgate.....	\$ 35
Sinbad.....	\$ 31
Uninvited.....	\$ 31
MINDWARE	
Descartes.....	\$ 26
Holmes.....	\$ 37
Page Flipper.....	\$ 39
NEW HORIZONS	
Flow.....	\$ 69
ProWrite.....	\$ 75
NEWTEK	
A500 Adapter.....	\$ 20
Digi-Paint.....	\$ 49
DigiView 2.0.....	Call
NEW WAVE	
Dynamic Drums.....	\$ 59
NIMBUS	
Accounting.....	\$ 99
ORIGIN SYSTEMS	
New! AutoDuel.....	\$ 35
Ogre.....	Call
New! Ultima III.....	Call
New! Ultima IV.....	Call
OPCODE SYSTEMS	
New! Music Mouse.....	\$ 66
OXXI	
Benchmark Mod. 2.....	Call
Encore.....	\$ 29
Maxiplan.....	\$ 99
Maxiplan Plus.....	\$127
WDW.....	\$ 29
PAR SOFTWARE	
Express Paint.....	\$ 59
New! Stellar Conflict.....	\$ 29
Wordplex.....	\$ 25
PPI SOFTWARE	
New! ART.....	Call
POLYGLOT SOFTWARE	
New! Crossword Creator.....	\$ 38
New! Dominoes.....	\$ 19
PROFESSIONAL SOFTWARE	
New! Fleet Check.....	Call
PROGRESSIVE	
CLI-Mate.....	\$ 25
New! IntroCad.....	\$ 63
Logistix.....	\$ 85
New! MicroLawyer.....	Call
PixMate.....	\$ 54
Superbase.....	\$ 81
New! Superbase Prof.....	Call
Vizaware.....	\$ 81
PROLIFIC INC.	
New! Pro-ASM.....	\$ 73
New! Pro-Board.....	Call
New! Pro-Net.....	Call
PSYGNOSIS	
Barbarian.....	\$ 28
Terror Pods.....	\$ 28
READY SOFT	
The 64 Emulator.....	Call
RIGHT ANSWERS GROUP	
New! Director.....	Call
S. ANTHONY STUDIO'S	
New! LaserUp!.....	\$ 64
New! Laser Utilities.....	\$ 32
SEDONA	
Money Mentor.....	\$ 74
SEVEN SEAS	
Doug's Math Aquarium.....	\$ 59
SIS	
C64 Emulator.....	Call
SLIPPED DISK	
New! Investor's Advantage ...	\$ 77

SOFT TOUCH	
Custom Screens.....	\$ 49
Paymaster Plus.....	\$109
SOFTWARE TERMINAL	
New! Telegames.....	\$ 26
SOFTWARE VISIONS	
MicroFiche Filter.....	\$ 79
SOFTWOOD	
Software File IIsig.....	\$ 89
Software Ledger.....	\$ 62
SSI	
Kampfgruppe.....	\$ 46
Phantasia.....	Call
Road War Europa.....	\$ 31
Road War 2000.....	\$ 32
New! Wrath of Nicodemus.....	Call
SUBLOGIC	
Flight Simulator.....	\$ 32
Jet.....	Call
Scenery Disk #7.....	\$ 18
Scenery Disk #11.....	\$ 20
SUNRISE INDUSTRIES	
New! Perfect Vision.....	Call
New! Studio Magic.....	\$ 75
SYNESIS	
New! Interchange.....	Call
TAURUS	
Acquisition.....	Call
X-CAD Designer.....	Call
TDI	
All Products Available	
Modula II - Comm.....	\$207
Modula II - Devel.....	\$109
Modula II - Reg.....	\$ 64
THE OTHER GUYS	
Match-It.....	\$ 29
Dmega File.....	\$ 60
Promise Spell Checker.....	\$ 39
New! Reason.....	Call
Synthia.....	Call
TIGRESS	
Diskwink.....	\$ 36
TRUE BASIC, INC.	
True Basic.....	\$ 74
9 Libraries (each).....	\$ 39
Runtime.....	\$109
UNICORN	
Aesop's Fables.....	\$ 35
Decimal Dungeon.....	\$ 33
Fraction Action.....	\$ 33
Kinderama.....	\$ 33
Read & Rhyme.....	\$ 33
Read-A-Rama.....	\$ 35
The Word Master.....	\$ 35
UNISON WORLD	
Art Gallery I, II	\$ 20
Printmaster Plus.....	\$ 33
VIP TECHNOLOGY	
Professional.....	\$114
WESTCOM	
ADFO.....	\$ 45
Hardhat.....	\$ 55
WORDPERFECT INC.	
WordPerfect.....	Call
ZEN SOFTWARE	
System Monitor.....	\$ 39
ZIRCONICS	
Prof. Text Engine.....	\$ 80

HARDWARE

ACCESS ASSOCIATES

Algra 512K..... Call

AMAZING DEVICES

Time Lord..... \$ 34

PROGR. R. REFERENCE

\$ 15

AMIGA

A500, A1000, A2000..... Call

All other products..... Call

ANAKIN

Easyl..... \$399

Easyl 500/2000..... Call

ANCHOR AUTOMATION

Omega 80..... \$165

APPLIED VISIONS

Futuresound..... \$144

AVATEX

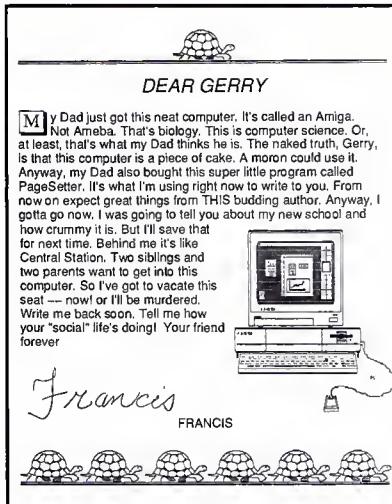
1200HC Modern..... \$115

SHIPPING INFO: Software Shipping rates are \$2.50/item using UPS Ground service (max. \$7.50) or \$4.50/item using UPS 2nd Day Air Service (max. \$13.50). Other shipping methods available. Call for hardware shipping, foreign, and mail rates.

RETURN & REFUND POLICY: All returns must have an RMA#. Call Customer Service to request an RMA#. Defective merchandise under warranty will be repaired or replaced. Returned product must be in original packaging. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantees must be handled directly with the manufacturer. **OTHER POLICIES:** We do not charge your card until the product actually ships. Purchase Order customers must have Credit Application on file. No surcharge for VISA and MasterCard.

Amiga is a trademark of Commodore-Amiga. Go Amigo is in no way associated with Commodore-Amiga. Delivery subject to product availability • Prices subject to change • Circle 26 on Reader Service card

This is a selection from the over 650 Amiga products we have in stock. New products arrive every day — please call for latest price and availability information.



DEAR GERRY

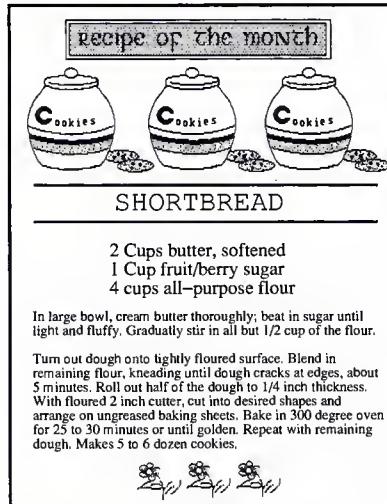
My Dad just got this neat computer. It's called an Amiga. Not Ameba. That's biology. This is computer science. Or, at least, that's what my Dad thinks he is. The naked truth, Gerry, is that this computer is a piece of cake. A moron could use it. Anyway, my Dad also bought this super little program called PageSetter. It's what I'm using right now to write to you. From now on expect great things from THIS budding author. Anyway, I gotta go now. I was going to tell you about my new school and how crummy it is. But I'll save that for next time. Behind me it's like Central Station. Two siblings and two parents want to get into this computer. So I've got to vacate this seat — now! or I'll be murdered. Write me back soon. Tell me how your "social" life's doing! Your friend forever

Francis

FRANCIS



Spice up your correspondence



SHORTBREAD

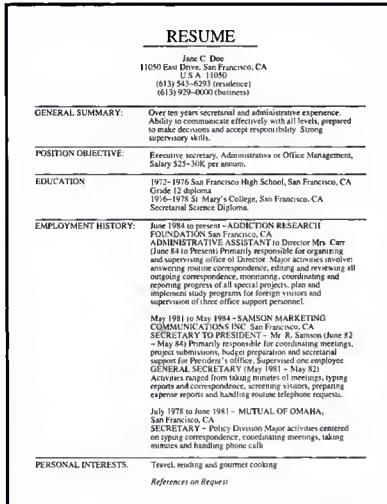
2 Cups butter, softened
1 Cup fruit/berry sugar
4 cups all-purpose flour

In large bowl, cream butter thoroughly; beat in sugar until light and fluffy. Gradually stir in all but 1/2 cup of the flour.

Turn out dough onto lightly floured surface. Blend in remaining flour, kneading until dough cracks at edges, about 5 minutes. Roll out half of the dough to 1/4 inch thickness. With floured 2 inch cutter, cut into desired shapes and arrange on ungreased baking sheets. Bake in 300 degree oven for 25 to 30 minutes or until golden. Repeat with remaining dough. Makes 5 to 6 dozen cookies.



Perfect for clubs, churches and schools



RESUME

Jane C. Doe
11050 East 16th Street, San Francisco,
U.S.A. 94116 (residence)
(613) 543-6293 (residence)
(613) 929-2000 (business)

GENERAL SUMMARY: Over ten years secretarial and administrative experience. Able to communicate effectively with all levels, prepared to make decisions and accept responsibility. Strong supervisory skills.

POSITION OBJECTIVE: Executive secretary, Administrative or Office Management, Salary \$25-30K per annum.

EDUCATION: 1972-1976 San Francisco High School, San Francisco, CA
Graduated with Honors
1976-1978 St. Mary's College, San Francisco, CA
Secretarial Science Diploma

EMPLOYMENT HISTORY: June 1984 to present - ADDITION RESEARCH - ADDITION INC., San Francisco, CA
ADMINISTRATIVE ASSISTANT TO DIRECTOR Mrs. Carr (June 84 to Present) Primarily responsible for organizing and scheduling meetings, preparing agendas, answering incoming correspondence, editing and reviewing all outgoing correspondence, monitoring, coordinating and reporting on projects, preparing reports, and implementing study programs for foreign visitors and supervision of three part-time support personnel.

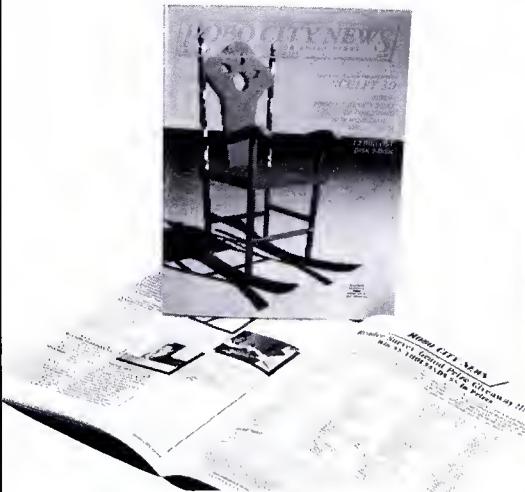
May 1981 to June 1984 - MARKETING COMMUNICATIONS INC., San Francisco, CA
SECRETARY TO PRESIDENT - Mr. R. Samson (June #2 - May 84) Assisted President in all aspects of his work, including project submissions, budget preparation and secretarial support for President's office. Supervised one employee (GLENDA) and coordinated all office activities.

Activities ranged from taking minutes of meetings, typing reports, correspondence, screening visitors, preparing expense reports, handling telephone calls and projects.

July 1979 to June 1981 - MUTUAL OF OMAHA, San Francisco, CA
SECRETARY TO POLICY DIVISION Major activities centered on typesetting correspondence, coordinating meetings, taking minutes and handling phone calls

PERSONAL INTERESTS: Travel, reading and gourmet cooking
References on Request

Stand above the crowd.
Create a lasting impression



Create an entire magazine.
PS is the Amiga standard



Produce true typesetting
with LaserScript (optional)



Write an entire book. And
don't forget the illustrations

Now. Think What PageSetter Can Do for You.

Whatever your application may be, a personal letter, school flyer, campus newspaper, or even a full fledged manual, you'll do it faster and better with PageSetter. After all, PageSetter is the undisputed leader in Amiga desktop publishing. In fact, your user group probably produces its newsletters using PageSetter. Amiga World says: "PageSetter is a very worthwhile program that can be put to use by a wide segment of the Amiga population." Amazing Computing calls PageSetter: "a very strong program with many capabilities." Commodore Magazine calls it: "One of the ten best Amiga software for 1987."

That's why thousands of Amiga owners have chosen PageSetter. David Biebelberg echoes the typical user: "PageSetter is powerful, simple and affordable. I had it up and running in minutes." We think you'll have a lot of fun with it.

If you're serious about doing exciting things on your Amiga, get PageSetter. Just think what you'll be able to do with it.



GOLD DISK

Get your copy of PageSetter at your local Amiga dealer or directly from Gold Disk. Call toll free 1-800-387-8192. In Canada (416) 828-0913. VISA, M.C., AMEX. \$149.95 U.S.

Gold Disk Inc., P.O. Box 789, Streetsville, Ontario, Canada L5M 2C2

Circle 212 on Reader Service card.

REVIEWS

AUDIOMASTER

*If you don't like what you hear,
change what you see.*

By Stephen Quinzi

AS ANY SOUND designer will tell you, a system's editing, not sampling, capability is the real test of its power. In this department, Amiga samplers have been weak, until AudioMaster, the software sampler/sample editor from Aegis Development. The most powerful Amiga sample editor I have seen, AudioMaster offers some editing features which previously were available only on high-priced sampling systems.

You can enter sounds to edit either by loading sound files from disk or sampling your own. The program loads IFF and Sonix files in their original format, but treats all others (such as the SoundScape format) as raw data. To sample with AudioMaster, you'll need a hardware digitizer which plugs into either the parallel or joystick port. I used a Perfect Sound parallel digitizer from SunRize Industries (\$89.95).

While the sampler offers both a high and low sample rate, the actual rate depends upon which type of digitizer you're using. With a parallel digitizer, the sample rates are 8,363 and 19,886 samples per second, resulting in maximum bandwidths of approximately 4kHz and 10kHz respectively. With a joystick device, the rates are 8,363 and 14,914 sps, with maximum bandwidths of 4kHz and 7.5kHz. A slider adjusts the sample size, the maximum being the amount of available memory. With a 512K machine and a parallel sampler, the maximum sample size is 230K, resulting in a maximum sample length of 27.5 seconds at

the low sample rate, and 12.5 seconds at the high rate. For larger samples, AudioMaster recognizes expansion memory. To check for input distortion, a real time oscilloscope monitors incoming data; however, it sends a signal through to the audio output. To avoid feedback, unplug or turn down the Amiga's audio monitor.

Once sampled or loaded, sounds are displayed in the Edit window. The window's cursor acts as a marker, but I would like a time line as well. A time line helps you keep track of things, especially when you're dealing with a large



Mark a section of the wave and zoom in.

sample. At the bottom of the screen is the control panel, for manipulating the display and playback of a wave. Click on Show Range to zoom in for detailed work or Zoom Out to see the whole wave. A zero crossing finder facilitates looping.

You can cut and splice waveforms together easily. After defining part or all of the wave as a range, select an edit command (Cut, Copy, Paste or Replace). Edit Freehand allows you to draw your own waveforms; however, I found this function to be very inefficient. Since the

waveform is displayed as a series of very fine dots, I couldn't always tell what I was actually drawing. The temporary save command, Snapshot, is a savior since all of the editing operations are permanent. By taking a snapshot before editing, you later can recall the original if you're unsatisfied with the changes.

IMPROVE REALITY

AudioMaster offers some interesting special effects. Echo repeats a specified range of the wave; you control the echo rate, decay rate and number of echos. Backwards plays a designated range backwards. Mix Waveforms combines the waveform displayed in the window with whatever is being held in the copy buffer. For a flanging effect you can adjust the pitch and volume of the buffered data. The Change Volume effect is like a two-stage (ramp up and ramp down by percentage) dynamic envelope generator, but is much more powerful than a conventional four-stage Attack-Decay-Sustain-Release generator. Since it acts within a specified range, you can apply it to either a small part of the wave, the entire wave or to several portions of the wave. By applying different ramp slopes to different sections of the wave, you can design complex multi-stage envelope shapes. While the Low Pass Filter removes high frequency noise, its only settings are on and off, and to my ears the slope sounds a little too steep. A variable filter would be more useful.

For integrating your samples into a musical score, you can tune and resample waveforms to a different pitch. To conserve memory, resample existing samples to a lower rate. The manual claims that this does not affect the sound, but I heard a significant degradation in the fidelity of a voice sample after resampling from a 20K to an 8K rate. ▶

Once you've created the most melodic (or cacophonic) sound known to man, you can save it in Sonix or IFF format. While saving, AudioMaster automatically converts the files to the low sampling rate, the speed most music programs use. If you need to maintain higher fidelity, HiFi Save will store the sound at its original high rate. Although the manual doesn't mention it, you *must* save all data to a separate data disk. If you try to save too much to the program disk, AudioMaster will trash the disk, erasing the disk validator. The same applies to Snapshot; unless you direct it elsewhere, it saves to DF0: by default.

THE REPORT CARD

Although I expected more from AudioMaster, the program does what it is supposed to do and, save for a few exceptions, does it well. The mouse-driven program is solid, easy to use and not copy-protected. The manual is fairly clear and well written; however, I think the telephone tech-support specialist could be more knowledgeable. Personally, I would include stereo sampling, panning and MIDI implementation on future updates or utilities, but even as it is, AudioMaster passes the editing power test with high marks.

AudioMaster

Aegis Development Inc.

2210 Wilshire Blvd. Suite 227

Santa Monica, CA 90403

213/392-9972

\$59.95

512K required.

MULTI-FORTH

Are you a programming renegade?

If so, here's your chance to go

FORTH and conquer.

By R.B. Trelease, Ph.D.

VARIOUS PUNDITS have labeled FORTH "arcane," "inscrutable" and "indecipherable," and FORTH programmers frequently seem to have a public image that combines rugged-individualism with devoted eccentricity. Despite such popular misperceptions, organizations like G.E., Boeing and Kodak have

used FORTH as an industrial secret weapon for rapid development of micro-computer hardware systems.

Creative Solutions Inc. (CSI), masters of 68000- and UNIX-based FORTH systems, now brings this exceptional programming tool set to the Amiga with Multi-Forth. While Multi-Forth provides high-level access to many complex native hardware and Intuition functions, the best way to appreciate what the program offers is to consider a few things about FORTH in general.

In formal terms, FORTH is an extensible, threaded, interpreted/compiled programming language system that uses stack-oriented, post-fix operations. In practical terms, FORTH words (subroutines and programs) execute a thread of jumps to other words (named subroutines) composing the working dictionary.



For those who need speed and expandability.

Post-fix (reverse-polish) notation requires that operands be placed on the stack prior to calling operators (4 5 +), as opposed to typical infix (algebraic) notation (4 + 5).

Although FORTH is very rapid on execution and suited to real-time control of system hardware and peripheral functions, the key to FORTH's power is its extendability. You can extend the system's functions by defining new categories of run-time words and adding them (compiling) to the dictionary. In this way, you can use FORTH to emulate LISP, implement a database management system, control equipment or perform conventional program tasks. From this point of view, FORTH has been dubbed a roll-your-own language—if you'd like

new system functions, add a new application vocabulary extension.

MUTI-TALENTED

Multi-Forth offers most of the math (byte, word and integer), logical, program control, file support and computational functions provided by typical FORTH-79 standard PC systems. Multi-Forth is *not*, however, a true superset of the FORTH-79 vocabulary. In contrast with the indirect-threaded code employed by typical PC-based FORTH systems, Multi-Forth uses "tokenized" direct-threaded code subroutines in its words. Header and code body portions of Multi-Forth words are located in separate vocabulary and object fields in memory. 32-bit numbers appropriate to the 68000 CPU perform mathematical and address operations. A single precision floating-point arithmetic extension is also provided.

Above and beyond this, the basic Multi-Forth vocabulary includes extensive support (words) for AmigaDOS and Intuition system calls, with numerous words for window, gadget and bit-map graphics management. The system supports full access to Amiga ROM library functions, sound drivers, I/O redirection and a window/printer debug utility. An in-line assembler allows you to optimize execution speed using 68000 opcode subroutines.

Multi-Forth is provided on two diskettes, with an over 300-page manual. The main disk (bootable) contains AmigaDOS system libraries, utilities, the Multi-Forth kernel and system and 26 FORTH source code files with functional extensions and demonstrations. Multi-Forth utility extension files include a FORTH source file printer, a fast two-drive backup utility, an in-line 68000 code assembler, a memory dumper, token editor, sprite toolkit, timer and word list generator. The main executable Multi-Forth development system runs with a complete set of preloaded Intuition structures and graphics calls.

Especially useful in development is the ability to call the CLI and other operating system utilities. You can directly call DIR and ED from within Multi-Forth, making it possible to write Multi-Forth programs with ED, while maintaining the Multi-Forth window for execution, interpretive extension and debugging. Likewise, you can list disk directories ►

Innovations from Inovatronics: The Next Generation!

The company that brought *PowerWindows* simplicity to Amiga programming is now your programming power source!

C.A.P.E. 68k: Complete Assembler Programming Environment

Are you tired of waiting for an assembler with a good, integrated editor? Tired of waiting for virtual file handling capability? Or are you just tired of waiting for your assembler to assemble files? Check this out!

*Integrated editor with choice of EMACS or Wordstar command sets. A first!

\$89.95 *Virtual file capability allows you to edit files larger than available memory. Another first!

*Highly optimized 68010 code yet Metacomco compatible

*Smart user-interface supports AREXX macro programming.

*FAST assembly from buffer and stop-on-error-line option.

Circle 50 on Reader Service card.

InovaTools I: Intuition enhancement libraries

This collection of new, flexible Intuition constructs exists in the form of Amiga system libraries as well as linkable C code. The package includes:

*List handler: These generic, ready to install routines control the display, selection, and scrolling of a "list-in-a-box."

*File-requester: Shows all mounted VOLUME names, performs filetype searches, stores matched names in ram. Easy to use.

*Drag gadgets: This new gadget can move from window to window without disturbing background imagery.

*Knob gadget: This circular, analog-type gadget is not only simple and accurate, it also makes an eye-catching addition to your interface design, replacing proportional gadgets.

*Palette Editor: Using our knob gadget, this palette editor uses both the R/G/B and H/S/I methods for easy control.

*Pop-up menus: This feature lets you "pop-up" a menu anywhere in a window that you can put your pointer. It allows the use of multiple menus in a single window, and accepts standard Menu structures.

Circle 80 on Reader Service card.

PowerWindows 2: Put your features where your mouse is!

The highly acclaimed screen-window-menu-gadget generator broadens its Amiga programming support:

*Direct support for the gadget and "pop-up menu" functions of

\$89.95 InovaTools I (Version 2.5 and higher)

*PW2 now supports (by code generation) Aztec C, Lattice C, MC68000Asm., TDI Modula-2, True BASIC, and Multi-FORTH!

Circle 100 on Reader Service card.

Innovations from Inovatronics. We speak your language.

INOVATRONICS, Inc.

The REAL *Power* in power programming

11311 Stemmons Freeway., Suite 8 Dallas, TX 75229
214/241-9515

Trademarks: Amiga:Commodore Business Machines, Multi-Forth:Creative Solutions Inc., True Basic:True Basic, Inc., Metacomco:Metacomco, Inc., Lattice C:Lattice Inc., Aztec C:Manx, Inc., TDI Modula 2:TDI Software, Inc. All packages support/require OS 1.2

without exiting the programming environment. The CSI Auxiliary files disk includes documentation on ROM kernel routine structures, library files for system executive symbols and calls, basic graphics structures, CSI rotating/scaling graphics, block-handling utilities, a floating-point math extension, sieve benchmark references and a "quick vocabulary" utility.

Multi-Forth enhancements offer a number of advantages over more conventional FORTH implementations. You can define local variables, allowing operations to be performed on named items within functions, with stack use simplified for parameter passing between functions. Data structure (or structure) notation is supported, allowing the definition of complex arrays with named components. Structures facilitate setting up the complicated data formats used for various Amiga system calls.

CSI has furnished a novel solution to FORTH community debates over whether source code is best developed in blockless text file format or in conventional FORTH block/screen (1K, 16 lines x 64 characters) format. In the default configuration, Multi-Forth uses standard ASCII text files, conveniently produced with Amiga's ED or other ASCII editors. If you desire, block-file support extension files can be INCLUDED for a system set to deal with standard FORTH screens. Block file support includes dual I/O buffers, a fairly typical FORTH line editor and a text-stream to block file translation utility. With these functions, you can easily upload block-oriented code from other systems for editing, conversion and customization.

By virtue of its 32-bit addressing scheme, Multi-Forth also allows you to exceed the 64K program size limit imposed by many FORTH systems. Since FORTH evolved in a 16-bit environment, limiting direct addressability to 64K, many programmers have followed inventor Charles Moore's lead in preserving code efficiency and inherent compactness. However, as some Artificial Intelligence programmers have aptly demonstrated, even good FORTH application code can occupy a lot of RAM space. Multi-Forth initially assigns its system limits to 64K, but you can resize them to use all available address space.

A turnkey utility produces auto-executing run-time images of Multi-Forth pro-

grams. In the FORTH tradition, turnkeyed programs are compact and fast. In an extension of its previous licensing policy with other products, CSI allows free distribution of turnkeyed programs (but not snapshot development systems) as long as a run-time Multi-Forth language copyright notice is preserved. Considering the price of a developer's license (less than \$90), system features and the availability of CSI phone and CompuServe-based user network support, the distribution policy is quite generous.

COMPARISON SHOPPING

As a user of CSI's MacForth, I was interested in how Multi-Forth compared with its older Macintosh brother. CSI used a common 68000 Multi-Forth kernel in developing implementations for the Macintosh and Amiga. MacForth isn't a better implementation than Multi-Forth, only different. In programming, MacForth uses pull-down menus for calling system functions, whereas Multi-Forth inputs control words to the CLI. While MacForth uses Macintosh QuickDraw monochrome graphics functions, Multi-Forth provides simplified high-level color graphics system calls and a complex set of words for direct calls to the Amiga ROM Graphics library.

A few disappointments may be found (or not found, as the case may be) in the Multi-Forth User's Guide, which gives a useful introduction to the basics of FORTH programming and describes major Multi-Forth Amiga-specific functions. However, in some instances, there are few good examples of critical system functions, and no mention of related component words in an otherwise excellent glossary of kernel and extension system words.

While I hesitate to recommend Multi-Forth to rank novice programmers seeking an easy exit from BASIC, CSI's system for the Amiga is a very powerful tool for a serious developer willing to work with FORTH. Perhaps the best part of the deal is user support, in the form of a newsletter, telephone hot line and access to CSI's FORTH network on CompuServe.

Multi-Forth

Creative Solutions Inc.

4701 Randolph Road, Suite 12
Rockville, MD 20852

301/984-0262

\$89

No special requirements.

REASON

Computers replace editors?

The Other Guys hope so.

By Matthew Stern

"REDUCE THE percentage of compound sentences and watch out for abstract terms. You have maintained a good balance of passive and active sentences and write at a tenth-grade reading level." These comments did not come from my editor, but from my Amiga, specifically from Reason, a text analysis program by The Other Guys.

Based on AT&T's Writer's Workbench program, Reason compares ratios of sen-

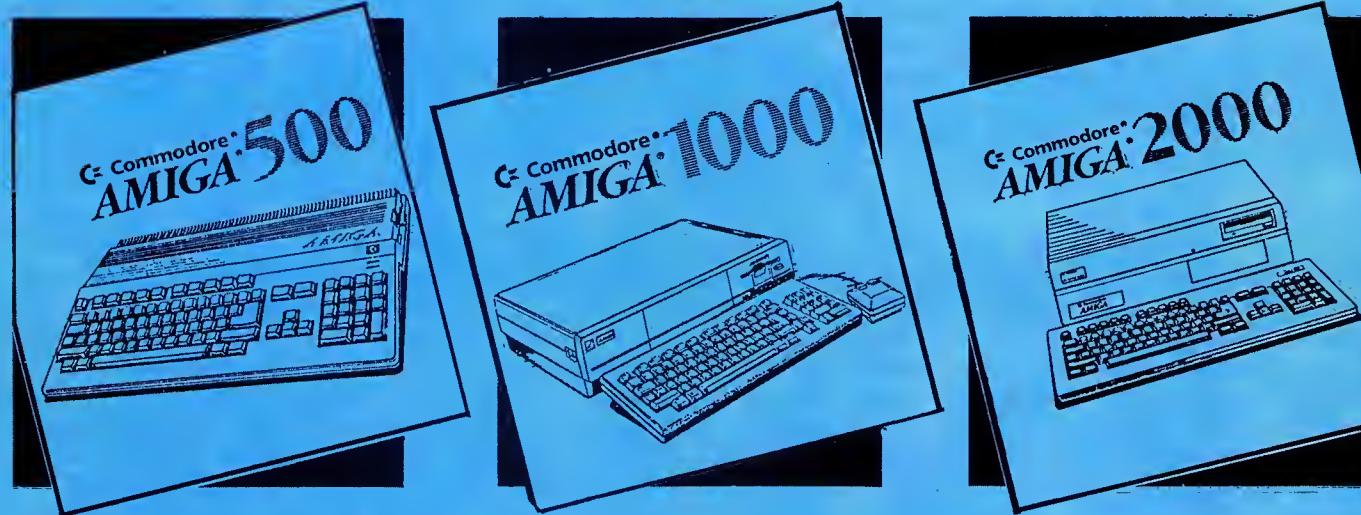


Reason's analysis of this review.

tence constructions and word lengths to Bell Laboratories' standards or parameters you develop. From these statistics, Reason determines how the document compares to several indices of readability—the Kincaid, the Coleman-Liau and the Flesch. Reason also offers specific suggestions for editing diction, style and organization.

Reason reads an ASCII file, then performs five major tests—Check Document for Prose, Critique Document for Style, Word Analysis, General Structure and Proofread Document. Check Document for Prose appraises your text, calculating the grade level required to read it, the percentage of active and passive sentences and the variation of simple and complex sentences. Critique Document ►

WHY PAY MORE!



**FREE SHIPPING*★ EVEN ON HARDWARE ★
FAST COURTEOUS SERVICE ★ FEDERAL EXPRESS AVAILABLE ★
AUTHORIZED BY COMMODORE ★ SALES AND SERVICE ★**

If By Some Oversight We Do Not Have the Lowest Price
Call and Give Us A Chance to Beat
Any Quote You May Have Received.

ALL PRICES REFLECT A 3% CASH DISCOUNT. ADD 3% FOR CREDIT CARD PURCHASES. COD ORDERS ADD \$4.00 PER BOX. ORDERS UNDER \$100.00 ADD \$4.00 SHIPPING AND HANDLING. QUANTITIES ON SOME ITEMS MAY BE LIMITED. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. APO, FPO ADD 6% ADDITIONAL SHIPPING. FOREIGN ORDERS ACTUAL FREIGHT CHARGED. ALL SALES ARE FINAL RETURN OF DEFECTIVE MERCHANDISE FOR REPLACEMENT ONLY WITH AUTHORIZATION. AUTHORIZED RETURNS ARE SUBJECT TO A RESTOCKING FEE. COMPLETE LISTING OF ALL SALES POLICIES AVAILABLE UPON REQUEST.

COLOR PRINTER OKIMATE 20

\$199
COMPLETE

24 Pin Head LQ Mode 144 Colors

Tractor & Friction Feed

LEADER BOARD	17700	I8M PC CROSS	OGRE	INFIDEL	2697
TOURNAMENT DISK-LEADER BOARD	1197	DEVELOPMENT PKG.	ONE-ON-ONE	LEATHER GODDESSES	2397
10TH FRAME BOWLING	2397	MIND WALKER	POLICE QUEST	OF PHOBOS	2397
FAIRY TALE ADVENTURE	2397	GIZMOZ	QUIZAM!	MOON MIST	2397
DISCOVERY MATH	2397	THE DIGITAL LINK	RETURN TO ATLANTIS	PLANTFALL	2397
DISCOVERY SPELL	2397	LPD FILER	ROAD TO MOSCOW	SEASTALKER	2397
DISCOVERY TRIVIA	2397	LPD PLANNER	ROCK AND ROLL-	SORCERER	2697
FAERY TALE ADVENTURE	2397	LPD WRITER	INSTANT MUSIC	SPELLBREAKER	2997
MICROLEAGUE BASEBALL	3597	ADVENTURE	SEASONS & HOLIDAYS	STARCROSS	2997
QUINTET	2697	CONSTRUCTION SET	ART DISK	SUSPECT	2697
BALANCE OF POWER	2997	ARCHION	SEVEN CITIES OF GOLD	SUSPENDED	2997
BRATACCUS	2997	ARCHION II: ADEPT	SKY FOX	TRINITY	2397
DEFENDER OF THE CROWN	2997	ARCTIC FOX	SPACE QUEST	WISHBRINGER	897
DEJA VU	2997	ART PARTS VOL. 2	ULTIMA III	WITNESS	2397
HALLIE PROJECT	2497	AUTODUEL	ULTIMA IV	ZORK I	2397
KEYBOARD CADET	2397	BARD'S TALE	WINNIE THE POOH	ZORK II	2697
KING OF CHICAGO	2997	BLACK CAULDRON	ZORAK	ZORK III	2697
MASTERTYPE	2397	CHESSMASTER 2000	ROGUE	ZORK TRILOGY	4197
IT'S DEGAS ELITE	2497	DELUXE MUSIC	TEMPLE OF APSHAI	A-COPIER	2397
IT'S PAPERCLIP ELITE	7590	CONSTRUCTION 2.0	TRILOGY	A-DISK	1797
ISGUR PORTFOLIO SYSTEM	14997	DELUXE PAINT	WINTER GAMES	WORLD GAMES	2397
AMIGA ASSEMBLER	5997	DELUXE PAINT	GUILD OF THIEVES	A-FILER	2997
AMIGA C	897	DATA DISK #1	PAWN	A-GRAPHIC	2397
AMIGA ENHANCER	4197	DELUXE PAINT II	STARGUARD	A-MAILER	2997
AMIGA LISP	2997	DELUXE PRINT	UNIV. MILITARY	A-REPORT	2997
AMIGA PASCAL	5997	DELUXE PRINT	SIMULATOR	A-TERM	2997
AMIGA TEXTCRAFT	5997	DATA DISK #2	CHAMPIONSHIP GOLF	X-RATED GRAPHICS	
AMIGATERM	2997	DELUXE VIDEO	CHAMPIONSHIP BASEBALL	LIBRARY	1497
GRAPHICRAFT	2997	DONALD DUCK'S	GBA CHAMPIONSHIP	ZING	4797
		PLAYGROUND	BASKETBALL	ZING KEYS	2997
		STRIP POKER	GFL CHAMPIONSHIP	AMIGA PASCAL	5997
		BITS THE SPREADSHEET	FOOTBALL	CAMBRIDGE USP	11997
		EARL WEAVER BASEBALL	AMIGA CHAMPIONSHIP	LATTICE C	8997
		FANTACIDE	GOLDEN OLDIES	MACRO ASSEMBLER	5997
		FINANCIAL COOKBOOK	INSTANT MUSIC	METACOMCO SHELL	4797
		INSTANT MUSIC	KING'S QUEST	METACOMCO TOOLKIT	2997
		KING'S QUEST II	KING'S QUEST III	ANALYZE	8997
		KING'S QUEST III	MARBLE MADNESS	BBS-PC BULLETIN	
		MAXIDESK	MAXIDESK	BOARD SYSTEM	5997
		NEW TECHNOLOGY	NEW TECHNOLOGY	FLIP SIDE	2997
		COLORING BOOK	COLORING BOOK	ON LINE	4197
				ORGANIZE	5997
				SCRIBBLE	5997

C.O.D. • MASTER CARD • VISA • AMERICAN EX • DINERS CLUB • SCHOOL PO'S ACCEPTED

1-800-331-7054 1-800-233-6345

S & S Wholesalers, Inc.

226 Lincoln Road • Miami Beach, Florida 33139

*On orders over \$100.00

for Style gives a detailed report on the results of the previous test. It can display words or sentences of specified lengths and reading levels, passive sentences and noun nominalizations. Word Analysis tests for diction problems (abstract words, acronyms, sexist words, split infinitives) and, in some cases, suggests alternative terms. To examine your document's organization, select General Structure. You can list frequently used words, the first and last sentences of every paragraph and the number of syllables in each word. The Sentence Breakdown option identifies the parts of speech that make up each sentence. The last test, Proofread Document, checks for incorrect spelling, diction, punctuation, double words and split infinitives. Reason does not alter the original file, so you must use a word processor to make any of the suggested changes.

From these tests, the program generates statistics and reports that can be printed or saved to disk. The results are easy to read, if you understand grammatical terms. The well written 130-page manual fully explains each test and contains an index, glossary and word use guide. Since you still need a knowledge of good writing style to interpret Reason's analysis, the bibliography suggests some supplemental reading.

Most writing departments have their own style guides, so Reason lets you generate custom standards and dictionaries from the statistics of at least 20 documents. Use the None...Just Print Statistics option from the Critique Document for Style test to generate the statistics, and save the results in a text file. The Build Custom Prose Standard option in the Extras menu reads each of the statistics files, calculates an average and saves the information in a new standards file. For proofreading, you can enter custom dictionaries and suggestion files of suitable replacement words.

The commands are logically arranged and labelled, so I was able to understand most operations without looking at the manual. The point-and-click control is convenient; however, I would like an option that automatically runs all the tests you select. Currently, you have to click a gadget each time you run a test.

VITAL STATISTICS

Reason is fast, but large. The program seems to perform most of its operations

in RAM, and it can run several options at once. Documents under 2,000 words took only a few seconds to analyze. Reason consumes most of a 512K machine's memory and can only be entered or abandoned by rebooting. You cannot multitask. While it disables Workbench, you can set Preferences from within Reason. According to The Other Guys, an updated version will support multitasking, Workbench and the CLI.

Professionals with a heavy volume of material to proofread and textbook writers who must aim their prose at a specific grade level will most appreciate Reason. The program excels at catching nagging grammatical errors. Be warned, Reason will not spot all your errors (or correct any automatically). Even the documentation only claims a 95% success rate. Unlike a human proofreader, Reason does not check for context, so some words flagged as in error may actually be correct. Nor will it analyze imperative sentences (such as "Reboot the disk.") correctly unless you type a tilde at the end.

With its hefty \$395 price tag, Reason is designed for people who know the rules of writing well. For the fledgling author, a \$3.95 copy of Strunk and White's *The Elements of Style* (The MacMillan Publishing Co.) would be vastly more helpful and informative. While Reason can check the mechanics of a document's structure, organization and diction, it cannot check its content, style and quality. That is still a job for human readers.

Reason

The Other Guys
PO Box H
Logan, UT 84321
800/942-9402 (in UT 801/753-7620)
\$395
512K required.

BUTCHER

Hide your mice—here comes the carving knife!

By Sheldon Leemon

DESPITE ITS provocative name and meat cleaver logo, Butcher 2.0 is neither a sick fantasy role-playing game nor an interactive meat-cutting tutorial. It is, in-

stead, the latest version of a very useful graphics tool. Though the program includes some painting facilities, it is not designed for creating pictures from scratch. Its real strength lies in its ability to manipulate pictures created with a paint package or digitizer.

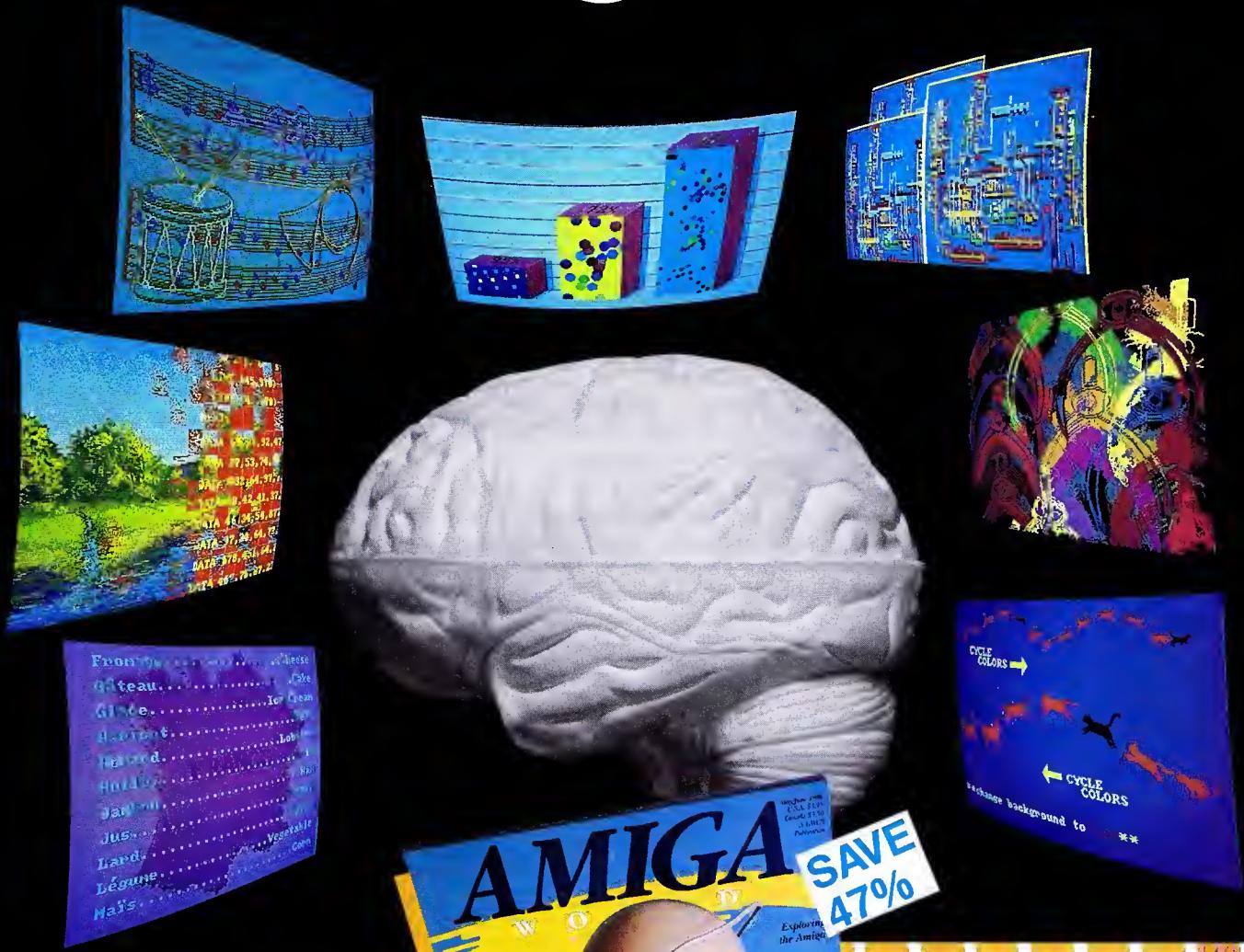
Once loaded, a picture will be displayed in whichever resolution it was saved. However, you may change either the horizontal or vertical resolution without affecting the picture's on-screen appearance. You can change the size of the picture bitmap, regardless of the display resolution, in order to work on pictures too large to be accommodated entirely on the screen. Butcher also lets you change the number of bitplanes, and thus control how many colors can be displayed at the same time as well as how much memory a picture takes. The program provides an option to convert pictures back and forth between the 4,096-color Hold-and-Modify (HAM) mode and 32-color low-resolution mode, but otherwise does not manipulate HAM images.

Many of the program's features affect only color. For that reason, it holds three complete palettes in memory at once and allows you to toggle between them. You can also copy whole palettes or remap colors from one to another. Butcher enables you to change any color or palette to its negative (opposite) values, exchange two colors or sort the palette by intensity of colors. It's easy to make your picture look like an antique photograph by tinting it with sepia tones (a range of faded browns), or you can tint it with any other color. The program allows you to introduce false colors by rotating the red, blue and green values of each color, or pseudo-colors which assign red, blue and green values to colors of varying intensity. There's a function to convert any picture to shades of gray, based either on color intensity or on the levels of red, blue or green components in each register.

CHOP! CHOP!

In addition to the palette-setting options, there are a number of image-processing functions that alter the actual composition of the pixels. Using Edge Mapping, a sophisticated function that allows you to produce a dark outline of the major features of a picture, you can make a digitized image resemble a charcoal ▶

The Machine To Unleash Your Imagination ...



The Magazine To Explore Its Vision

For a computer as extraordinary as the Amiga™, you need a magazine that can match its excellence, *AmigaWorld*.

AmigaWorld is the only magazine which provides you with ideas and information to get maximum performance from the Amiga's tremendous power and versatility.

Each issue gives you valuable insights to boost your productivity and enhance your creativity.

Whether you choose the Amiga as a serious business tool for its speed and multi-tasking capabilities ... or for its superb graphics, drawing, color, (over 4,000 colors), and animation ... or for its state-of-the-art music and speech ... or for its scientific and CAD abilities, *AmigaWorld* can help you achieve superior results.

With its timely news features, product announcements and reviews, useful operating tips, and stunning graphics, *AmigaWorld* is as dynamic as the market it covers.

Don't wait! Become a subscriber and save nearly 47% off the cover price. Return the coupon or the attached card. For immediate service, call toll free 1-800-258-5473. In NH, call, 1-924-9471.



Yes!

I want to discover the full potential of this powerful machine. And save nearly 47% off the cover price. Enter my one year subscription to *AmigaWorld* for the low price of \$24.97. If I'm not satisfied at any time, I will receive a full refund—no questions asked.

Payment Enclosed Bill Me

Name _____

Address _____

City _____

State _____ Zip _____

Canada \$47.97 (Canadian Funds). Mexico \$29.97, Foreign Surface \$44.97 (US Funds drawn on US Bank). All rates are one year only. Foreign Airmail please inquire. Please allow 6-8 weeks for delivery.

AmigaWorld
P.O. Box 868, Farmingdale, NY 11737

Amiga is a trademark of Commodore-Amiga, Inc.

382B2

sketch. This option is very helpful in reducing the complexity of an image, breaking it down to its barest outline. The Filter feature changes isolated pixels or groups of pixels to match the colors of neighboring ones. Mosaic performs a function known as "pixelization," re-drawing the picture using large block patterns instead of individual pixels. You can even edit the shape of these block patterns on a 32 x 32 grid. The program also includes functions for converting colored pictures to black-and-white; dot patterns of varying density replace the colors by means of dithering patterns.

This latest version of Butcher (2.0) allows you to define a rectangular area (a "clip") in which to confine image manipulation. This is helpful for operations that will work with only one section of the image. You may also save or print the clip separately. Most of the functions let you select a color by clicking on any part of the screen displaying that hue. The program was clearly designed with multitasking in mind, since it provides several options that allow you to manage the amount of memory used. You can load each part of the program separately, close the Workbench screen or delete the bitmap used for the UNDO buffer, and monitor available memory. Overscan eliminates screen border.

Butcher is particularly good for cleaning up digitized images. If you digitize four-color artwork, for example, you'll find that due to lighting variations, there may be six shades of red, eight shades of blue and many shades of gray in a single picture. Butcher allows you to sort colors by the frequency of their appearance, then merge or blend similar tones to yield exactly four colors. By consolidating pixels that are identical in color but were drawn from different palettes, it enables you to reduce the number of color registers used in the image. This operation is a prerequisite for transferring images into a program like DeluxeVideo (Electronic Arts) which restricts you to eight colors.

Butcher is a powerful aid for work that requires conversion between graphics or resolution modes. It delivers what it promises, and I did not find any bugs. By effectively accomplishing a number of graphics tasks, Butcher proves again that famous old proverb: "the meat cleaver is mightier than the mouse."

Butcher 2.0
Eagle Tree Software
 PO Box 164
 Hopewell, VA 23860
 804/452-0623
 \$37
 512K required.

DOUG'S MATH AQUARIUM

"On the monitor—a shark!"

"Relax, it's just cos[π(3x ÷ zy)]"

By Louis R. Wallace

WHAT THE HECK IS a math aquarium? Generally, the word "aquarium" calls to mind those civic establishments that exhibit aquatic lifeforms. Only after a thorough tour of this program did I appreciate the relevance of the name. Doug's Math Aquarium transforms your computer into an interactive exposition center for exotic mathematical equations, where you can closely examine plots of functions—even "walk around" and view them from different vantage points just like in a conventional aquarium.



Complex math never looked this good.

Doug's Math Aquarium is nicely mapped out so that even a first-time visitor can quickly and easily find his way to the exhibits. Just inside the entrance is the Numerical Swamp (otherwise known as the formula input area) where you plug in an equation and choose either the Contour or Wire Frame display mode. Then, as you peer through the glass of your monitor, your equation's pictorial manifestation slowly emerges. Images range from stunningly beautiful

and complex to mere visual "noise," depending upon the expression entered.

BELOW THE SURFACE

The Numerical Swamp will accept any formula defined in terms of X and Y. Doug's plots equations as you did in high school algebra. Instead of points connecting the familiar solitary line on the chalkboard graph though, X and Y become positions on the screen's invisible axes; color and gradation are added to yield a far more interesting portrayal. What's more, Doug's can easily graph complex two- and three-dimensional equations that would run you out of chalk, time and patience. You can create equations of up to four functions, using any combination of the many supplied (including Boolean and trigonometric functions) and your own. By plugging in "If/Then" statements, you can invoke recursion (the disk supplies an example of a recursive function in its description of a Mandelbrot).

You may want to manipulate your equation's graphic outcome with some of the many options. You can, for example, set the minimum and maximum values for X, Y and Z. Scaling forces color into a range of values in Contour, while in the Wire Frame mode it adjusts the image to fit entirely on the screen. Some 3-D wire functions are: Perspective, for viewing plots, Hidden Line, which makes a wire model appear solid, and Viewpoint, which allows you to determine a viewpoint.

Once your equation appears on screen, you can use Zoomin and Zoomout from the Action menu to examine areas of particular interest. You can perform other operations too, such as finding the X and Y values of any location (part of the equation) by selecting Analyze, then pointing to the area and clicking the mouse. Doug's Math Aquarium supports the four standard Amiga screens (320 x 200, 320 x 400, 640 x 200 and 640 x 400) but does not support printers or HAM and HALFBRITE modes. You can, however, save a screen in IFF format so that it may be used with virtually any Amiga graphics program. Alternately, you can conserve space by saving just the equation.

Most of the menu options are self-explanatory, and the manual will clarify anything not readily understood. The authors have stated that their objective was ▶

1-800-752-0050
FOR ORDERS ONLY

Call for
Trade-In
CUSTOMER SERVICE
for
A-1000 / A-2000

THE SOFTWARE SHOP

Diskettes

5 1/4 DS/DD Floppy	Call
Fuji Double Sided Disks	\$22
Maxell MF2 DD	\$22
Sony 3.5 DS/DD	\$23
TDK 3.5" DD Disks	\$22

Desk Top Publishing

City Desk	\$109
Page Setter	\$99
Professional Page	\$265
Publisher 1000	\$145

Educational

Aesop's Fables	\$35
Animal Kingdom	\$35
A Talk Plus	\$73
Decimal Dungeon	\$35
The Demonstrator	\$25
Discovery Math	\$29
Discovery Spell	\$29
Discovery Trivia	\$29
Donald Duck's Playground	\$25
Dr. Xes	\$37
First Shapes	\$34
Fraction Action	\$35
Grade Manager	\$59
Great States	\$29
Kid Talk	\$39
Kinderama	\$35
Linkword French	\$25
Linkword German	\$25
Linkword Italian	\$25
Linkword Russian	\$25
Linkword Spanish	\$25
Match It	\$32
Math Talk	\$39
Math Talk Fractions	\$34
Math A Magician	\$32
Math Wizard	\$39
Music Student	\$42
New Tech Clr. Book	\$27
Puppy Love	\$24
Quiz Master	\$55
Read & Rhyme	\$35
Speller Bee	\$35
Talker	\$48
Talking Coloring Book	\$25
Winnie the Pooh	\$21
Word Master	\$35

Accessories

Ece 500 Amiga	\$49
A500 Centronic Cables	\$17
A-B Data Switch	\$55
A/B/C/D Switch Box	\$78
Epxy Joystick	\$18
Gender Changer	\$20
Jitter Flicker	\$14
Midi Cable	\$19
Modem Cable	\$17
Mouse Pad	\$10
Polaroid 3.5 DS/DD Disks	\$21
Printer Cable	\$17
R.F. Modulator	\$45
A/B/C/D Switch Box	\$78
Tac-3 Joystick	\$18
Teakwood 120 Cap.	\$35
Teakwood 64 Cap.	\$28
Teakwood 60 w/ Lock	\$31
Time Saver	\$65

Business Accounting

B.E.S.T.	\$310
Financial Plus	\$199
Investors Advantage	\$69
Miamiga Ledger (Softwood)	\$66
Nimbus I Record Keeper	\$120

Cinemaware

Defender of the Crown	\$35
King of Chicago	\$35
S.D.I.	\$35
Sinbad	\$35

Communications

BBS PC	\$65
Diga	\$55
Digital Link	\$49
Macro Modem	\$52

Copiers

Hacker Package	\$35
Marauder II	\$29
Mirror	\$35
Quick Nibble	\$30

Creativity & Product.

Analytic Art	\$42
Art Gallery I	\$25
Art Gallery II	\$25
Brushworks	\$25
Fastfont	\$30
Flipside	\$44
Fontset I	\$25
Gizmoz Enhance	\$40
Grabbit	\$24
JDK Bulletin Bold Font	\$25
Kwickstart	\$159
Microlawyer	\$42
Print Master Plus	\$37
The Surgeon	\$35
TV * Text	\$70
Zuma Fonts I	\$25
Zuma Fonts II	\$25
Zuma Fonts III	\$25

Database Management

Acquisition	\$199
Microfiche Filer	\$89
Organize!	\$65
Softwood File II SG	\$79
Superbase	\$99
Superbase Professional	Call

Product subject to availability. Prices subject to change.

Shipping Info: C.O.D. Charge only 3% per shipping. We ship UPS Ground, Air, and overnight shipping available. For faster delivery send Cashier Check, Money Order, or use MasterCard or Visa. Personal checks allow 20 days to clear. Company purchase orders accepted. Call for prior authorization. Mass. residents add 5% sales tax.

Amiga is a trademark of Commodore-Amiga, Inc.

84 Pleasant Street
Worcester, MA 01609



A-500



A-2000

HOLIDAY SPECIAL
Buy DIGIVIEW CAMERA with
Lens, and DIGIPAINt for
\$429.00 and Get the CopyStand
FREE.

Easy!	\$379
E.C.E. Midi Interface	\$55
Miniscribe Hardisk M8438F	\$399
Perfect Sound	\$65
Seikosha Printer MP 1300	\$405
Seikosha Color Kit	\$129
Sony 12090 Monitor	\$559
Spirit Expan. A1000 1.5MG	\$469
Spirit Expan. A500 1.5MG	\$459

Languages Utility

A/C Basic	\$145
A/C Fortran	\$230
Amiga Assembler	\$75
Aztec C Commercial 3.4	\$350
Aztec C Developer 3.4	\$225
Aztec C Professional 3.4	\$169
CLI Mate	\$29
Cross Assembler	\$69
Custom Screen	\$42
The Debugger	\$65
Dos to Dos	\$39
Disk to Disk	\$37
Editor Sources	\$35
Enhancer	\$14
Example Programs	\$20
Expert Programs	\$20
Expert System Kit	\$40
Facc II	\$27
Kermit File	\$25
Lattice C	\$149
Lattice C Professional	\$275
Menu Maker	\$45
Power Windows	\$75
Shell	\$49
Sorting & Searching	\$37
System Monitor	\$37
True Basic Libraries	\$39
TDI Modula II Commercial	\$225
TDI Modula II Dev. (N.V.)	\$110
TDI Editor Source	\$35
TDI Modula II STD (N.V.)	\$69
True Basic	\$105
Txed	\$30
Zing	\$55
Zing Keys	\$30

Printers

Okimata 20 Interface	\$80
Okimata 20	\$225
Panasonic KX-10911	\$345

Sound & Music

Deluxe Music	\$69
Dynamic Drums	\$52
Inst-Music Data Disc #1	\$25
Inst-Music	\$35
Hot & Cool Jazz	\$25
Music Studio	\$45
Pro-Midi Studio Soundscape	\$134
Sonix	\$55
Sound Sampler	\$89

Spreadsheets

Analyze! 2.0	\$100
Haicalc	\$39
Maxi Plan 500	\$109
Maxi Plan Plus (N.V.)	\$139
VIP Professional	\$129

Training

Flight Simulator II	\$38
Key Board Kadet	\$30
Master Type	\$30
Scenery Disc 7 or 11	\$24
Silent Service	\$30
Super Huey	\$30

Wordprocessors

Flow, Idea Processor	\$69
Gold Spell	\$33
Laser Script	\$33
Lexcheck	\$35
LPD Writer	\$89
Miamiga Word	\$66
Promise	\$35
Prowrite	\$89
Scribble! 2.0	\$65
Viza Write	\$109
Word Perfect	\$239

Circle 134 on Reader Service card.

to utilize math for fun and artistic expression; consequently the manual guides you in using the program, leaving out the mathematics lessons.

I suppose the Aquarium would be useful for students in mathematically intensive courses, and teachers might find it an attractive method of demonstrating esoteric scientific principals. More often than not though, I suspect it will find its way into the hands of individuals who would enjoy spending a quiet hour or two zooming into a Mandelbrot, examining the graphic effects of a change from cosine to arctangent on a 3-D function, or exploring some obscure mathematical territory that, very possibly, no other human has ever before seen. The program might also appeal to the artist searching for another way of looking at the world, or just a small part of it. Once submerged in Doug's Math Aquarium, you too may find it entertaining, engrossing and even a little addicting, just as I did.

Doug's Math Aquarium

Seven Seas Software

PO Box 411
Port Townsend, WA 98368
206/385-3771
\$89.95
512K required.

HAICALC

In the ranks of spreadsheets, it's a great place to start.

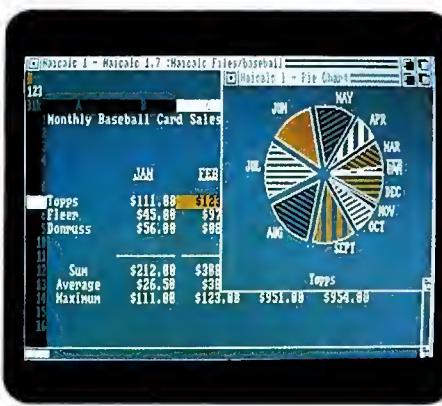
By Sandra Cook Jerome

IN THE CURRENT Amiga spreadsheet battle, Haitex Resources has taken aim to capture beginner and budget-minded users with Haicalc. While those familiar with other spreadsheets might point out major features that this program lacks, Haicalc offers speed and simplicity at a price considerably lower than its competitors.

Once loaded, the colorful spreadsheet appears with the cursor ready to go in cell A1. You can enter numbers and labels, or access a pull-down menu with the mouse. The menu makes available many standard commands for changing column width or formatting numeric displays. You can also activate frequently used commands such as Copy, Save or

Print by typing a slash and the first letter of the command. Haicalc supports most Amiga features such as multitasking and multi-windowing.

Even experienced spreadsheet users might consider this program for simple tasks; the input and display speeds surpass those I have seen in any other spreadsheet. Haicalc uses adjustable gadgets for quick scrolling across and down. You can increase the scale of the gadget to allow instant display of a frequently-referenced column when working with a very large spreadsheet, or size it down for a small one. You can also adjust the return key to move the cursor in any of four directions. If you are entering numbers in just one column, for example, you can save steps by programming the return key to move the cursor down instead of across. Two other time



Haicalc and one of its five graphs.

savers are function keys that enter common commands and simple keystrokes for menu shortcuts. Additionally, for those of us who never understood why it was necessary, the end parenthesis can be omitted when entering ranges.

THE SACRIFICE

Haicalc does not intend to compete with the more powerful spreadsheets on the market, and it is apparent that some sacrifices were made to keep the price low and the speed high. Because there are no database functions included, even a simple sort is impossible. There are only six functions—@AVG, @MAX, @MIN, @SUM, @COUNT and @CELLS—compared with 63 in MaxiPlan Plus (Oxxi Inc.). The program can generate bar and pie graphs, but screen dump capability, which is required to print a graph, is not included. To update totals you must

press a function key, as the spreadsheet does not automatically recalculate. The Copy command places the value or formula into a buffer instead of transferring it directly, so a two-step process of Copy to buffer and Paste to range is in order. Files created with Haicalc are not compatible with other spreadsheets, and the program can import only ASCII files. While you may display any system font on screen, only variations such as bold, italics and underlined are available for printing.

Haicalc is not powerful enough for tough financial projects, but it is an ideal starter spreadsheet—functional, easy to learn and a good value.

Haicalc

Haitex Resources

208 Carrollton Park Suite 1207
Carrollton, TX 75006
214/241-8030
\$59.95
512K required.

VISUAL AURALS

"The colors, man. I mean, the colors! Like, wow!"

IN THE LATE '60s it would have been called a color organ. Color organs were boxes with Christmas lights strung inside, that you set by your stereo. They would pulse and change colors, more or less, to the beat of the music. They were very hip. Very far out. Very groovy. They also didn't work very well. Nearly 20 years later technology has advanced far beyond the Christmas tree lights stage. We have chips and printed circuit boards. We have super sophisticated personal computers like the Amiga. And now we have Visual Aurals.

Visual Aurals with the Mindlight 7 (a circular box that plugs into the second mouse port) is the most sophisticated, most complex, most technologically advanced color organ ever devised by humans. Plug in the Mindlight 7, boot up the software, turn on some music and watch the screen do some colorful things in time to the music. That's about it.

GETTING IN DEEP

The Mindlight 7 measures and processes sounds, either from its built in micro- ►

**NEW
for the
AMIGA**

Precisely™

The Word Processor
that doesn't try to be
a desktop publisher.

Programs designed for graphic artists are difficult to learn, hard to use, tie up lots of memory, cost too much, and do not handle text very well. Graphics printing on a dot matrix or daisy wheel printer is very slow.

Introducing PRECISELY. The word processor optimized for people who work with words not pictures! Everything you expect in a

word processor, such as:

- What you see is what you get (WYSIWYG)
- Very fast screen update/printer speed
- Easy to learn and simple to use
- Converts PaperClip, Pocket Writer and SpeedScript documents
- Online HELP • Mail Merge • Keyboard Macros
- Ops Key to undo mistakes
- Built in spelling checker coming soon

This is PRECISELY the word processor you've been looking for at PRECISELY the right price! Only \$79.95 (sometimes less is more). Add \$3.00 for shipping and handling, CA residents add 6% sales tax.

*Don't fumble around with your Amiga files.
Let QUARTERBACK manage your valuable data.
The Quarterback sneak scores every time!*

QUARTERBACK™

*Quarterback is a FAST Hard Disk to Floppy Backup Utility
for the Commodore Amiga, featuring:*

- Fast backup - 20MB in less than an hour
- Full/Subdirectory/Incremental backup
- Full/Subdirectory/Single File Restore
- Automatic formatting of diskettes
- Automatic catalog of files
- Automatic diskette sequence numbering and checking
- Runs with Workbench or CLI
- Includes/excludes files by name and/or wild card
- Selects files by date
- Selects files by Archive bit
- Estimates number of floppies needed
- Accepts batch command files
- Validates writes
- Restores original file date/time stamp
- Prints backup/restore report
- Allows easy access to subdirectories
- Beeps for floppy change
- Provides AmigaDOS access from within
- Convenient/user friendly error recovery
- Multitasking
- No copy protection
- Works with all AmigaDOS compatible hard disk drives

*You'll have fewer "time-outs" with
QUARTERBACK managing your file backups.*

Put Quarterback on your team for only \$69.95 plus \$3.00 for shipping and handling, CA residents add 6% sales tax.

TRANSFER FILES

TRANSFER C64/C128 files to and from your Amiga!

DISK-2-DISK reads your PaperClip, SpeedScript and Pocket Writer documents or other files on floppy disk directly into your Amiga. Transfers all file types. Use these transferred files with your favorite Amiga programs.

- Reads/writes 1541/4040 and 1570/1571 disk formats.
- Converts Commodore/PET ASCII to Amiga ASCII and vice versa.

TRANSFER MS-DOS and ATARI ST files to and from your Amiga!

DOS-2-DOS reads Lotus 123 worksheets, wordprocessing documents or any other files on floppy disk directly into your Amiga for use with your favorite Amiga programs.

- Reads/writes both 5.25" AND 3.5" MS-DOS disks.
- Reads/writes 3.5" Atari ST diskettes (GEM format).
- Converts ASCII file line ending characters.

Disk-2-Disk requires the Amiga model 1020 5.25" disk drive. Dos-2-Dos runs on any standard Amiga. Disk-2-Disk \$49.95, Dos-2-Dos \$55.00. Add \$3.00 for shipping and handling, CA residents add 6% sales tax.



Central Coast Software™

268 Bowie Drive, Los Osos, California 93402 • (805) 528-4906



Software Guide Corrections

The following companies and products were listed incorrectly in the December '87 Software Buyer's Guide:

Brown-Waugh Associates should be Brown-Wagh Associates. Contact them at 16795 Lark Ave., Suite 210, Los Gatos, CA 95030, 408/395-3838.

Dr. Tease is actually Dr. T's, located at 220 Boylston St. Suite 306, Chestnut Hill, MA 02167, 617/244-6954.

Fantasia I and III should be spelled Phantasie, and are available from Strategic Simulations, 1046 N. Rendstorf Ave., Mountain View, CA 94043, 415/964-1353.

Micro-Systems Software can be reached at 12798 Forest Hill Blvd. Suite 202, West Palm Beach, FL 33414, 305/790-0770.

NewTek's name is one word, not two. Direct your product inquiries to 115 West Crane St., Topeka, KS 66603.

Ultraball was Arkanoid's working title. The game is available from Discovery Software Int., 163 Conduit St., Annapolis, MD 21401, 301/268-9877.

MOVING? Subscription Problem?

Get help with your subscription by calling our new toll free number:

1-800-227-7585

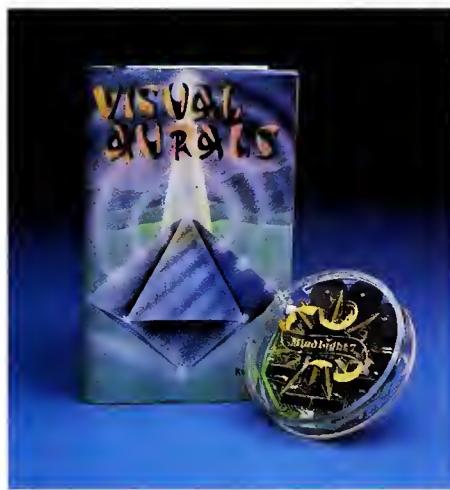
between 9 a.m. and 5 p.m. EST Monday-Friday

If possible, please have your mailing label in front of you as well as your cancelled check or credit card statement if you are having problems with payment.

If moving, please give both your old address and new address.

AmigaWorld
PO Box 868
Farmingdale, NY 11737

phone or stereo phono input or from both. It measures Overall Intensity, Overall Frequency, Bass Intensity, Bass Frequency and Treble Intensity. It transduces audio signals from 20Hz to 16kHz and the gain can be adjusted from 0 to 10,000 all with a frequency response from 20Hz to 20kHz. The Mindlight 7 is also a complete MIDI recorder and sequencer with mouse controlled pitch, modulation, tempo and transpose functions. It supplies a fully adjustable sync out signal for drum machines, etc. (The manual suggests MIDI-Gold from Golden Hawk Technologies.) There is only enough storage space for 2,500 notes (assuming two MIDI events per



Feelin' groovy . . .

note, On event, Off event). On top of the Mindlight 7 are the three thumbwheels that adjust microphone gain, overall gain and visual bias levels (the level at which a sound will trigger a visual response). The unit couples audio signals into four groups (Bass Intensity and Treble Intensity, Overall Intensity and Frequency, Bass Intensity and Frequency, and Overall and Treble Intensity) which are then fed into the system.

Once in the system the sounds trigger changes in the visual display. Colors, shapes, speed, patterns, waves, dots, sprites, brushes, IFF picture files, genlocked images and on and on, all are influenced, changed, altered by the sounds.

You can select six different arrangements of visuals, pictures and video. There are 84 shapes, waves, lines and patterns available. You can choose from five major (and a multitude of minor) methods of fading from one image to

the next, and a minimum of 16 modifiers for the visuals and faders. Pile on top of this three separate color palettes (with 10 more available in special cases) with six color modes influenced by five sound parameters and variation numbers ranging from -100,000,000 to +100,000,000 that can alter any of these changes taking place on the screen (which can be lo-res, med-res, hi-res, interlaced, HAM, four, eight, 16 or 32 colors, with IFF files, IFF brushes, sprites, "visual environments") which can be loaded from any drive or drives (hard, floppy, RAM or user-specified directory) either automatically or alphabetically (forward or backward, of course) using keyboard or mouse; but, like, each thing can be changed using the function keys, numeric keyboard, mouse, number keys and regular keyboard keys or you could let the music itself change stuff based on sound peaks, sound level, smoothed audio, "bow," horizontal and vertical (color changes depending on the location of the current drawing object on the screen) or using one IFF screen as a mask so that the patterns and colors don't intrude on the space of something else or just cycle the colors and changes and fades and drop screen and spare drop screen and on and on and on. . .

Whew!

Confused? Don't worry. You're offered two types of help (each with variations) that do amazing things all by themselves (the "help crystal" mode tells you "the rate or selection within the currently selected modifier" by its position relative to the cursor. If the crystal appears above the cursor, the up arrow was the last key pressed to alter the modifier. If the crystal appears to the left, the left arrow was the last pressed. See?)

A simple (if I can even use the word "simple" when talking about Visual Auras) list of all the functions and features of Visual Auras would be longer than this review section, but if there were two that should be mentioned they would have to be Mozaic and X-Kolai. Doing a severe disservice to either of these features (as the manual states "This effect is not explained by mere words"), Mozaic is a mosaic-like method of creating visuals, changing visuals and fading from one visual to another, and X-Kolai is a mutated polygon deforming method of doing pretty much the same thing. . . only not. Does that clear things up? Oh, there are ►

AMIGA

HARDWARE AND SOFTWARE

1-800-423-7347

AMIGA 500	
1 MB, COLOR	\$999.00
AMIGA 1000	
512 K, COLOR	\$1069.00
AMIGA 2000	CALL

SOFTWARE

ACCESS		
LEADER BOARD	\$27.00	
ACCOLADE		
MEAN 18	\$29.95	
MEAN 18 COURSE DISK	\$13.00	
ACTIVISION		
BORROWED TIME	\$29.00	
HACKER II	\$39.95	
MINDSHADOW	\$31.00	
PORTAL	\$29.00	
SHANGHAI	\$35.95	
TASS TIME IN TONETOWN	\$35.95	
MUSIC STUDIO	\$36.25	
AEGIS		
ANIMATOR/IMAGES	\$79.00	
DRAW	\$75.00	
DRAW PLUS	\$165.00	
IMAGES	\$29.00	
IMPACT	\$56.00	
SONIX	\$59.00	
ELECTRONIC ARTS		
ARCHON	\$31.00	
ARCTIC FOX	\$29.00	
BARDS TALE	\$29.00	
CHESSMASTER 2000	\$29.00	
DELUXE MUSIC	\$59.00	
DELUXE PAINT	\$63.00	
DELUXE PRINT	\$72.00	
DELUXE VIDEO	\$81.00	
FINANCIAL COOKBOOK	\$35.00	
INSTANT MUSIC	\$23.00	
MARBLE MADNESS	\$31.00	
ONE ON ONE	\$28.50	
OGRE	\$28.50	
SEVEN CITIES OF GOLD	\$29.00	
SKYFOX	\$29.00	
ULTIMA III	\$31.00	
EPYX		
ROGUE	\$28.50	
TEMPLE OF APSHAI	\$16.97	
WINTER GAMES	\$28.50	
WORLD GAMES	\$29.00	
GAMESTAR		
CHAMPIONSHIP BASEBALL	\$25.00	
CHAMPIONSHIP GOLF	\$39.95	
GFL FOOTBALL	\$34.95	
TWO ON TWO BASKETBALL	\$34.95	
FIREBIRD		
PAWN	\$39.95	
STARGLIDER	\$31.00	
GOLD DISK		
PAGESETTER	\$119.95	
INFOCOM		
BALLY HOO	\$29.00	
BUREAUCRACY	\$26.96	
ENCHANTER	\$26.96	
HOLLYWOOD HIJINX	\$26.96	
LEATHER GODDESSES	\$26.96	
MOONMIST	\$29.96	
PLANETFALL	\$26.96	
STAR CROSS	\$29.00	
SUSPENDED	\$25.00	
THE WITNESS	\$24.95	
TRINITY	\$26.96	
WISHBRINGER	\$26.95	
ZORK I	\$25.00	
ZORK TRILOGY	\$27.95	
MICROPROSE		
SILENT SERVICE	\$25.00	
MICROSYSTEMS		
ANALYZE	\$99.00	
ANALYZE V. 2.0	\$119.95	
BBS-PC	\$65.00	
ON-LINE	\$45.00	
ORGANIZE	\$65.00	
MINDSCAPE		
BALANCE OF POWER	\$39.95	
BRATACCUS	\$31.00	
DEJA VU	\$31.00	
KEYBOARD CADET	\$29.00	
RACTOR	\$35.95	
SDI	\$31.95	
THE HALLEY PROJECT	\$29.00	
THE PERFECT SCORE	\$55.00	
UNINVITED	\$33.75	
NEW TEK		
DIGI VIEW	\$149.00	
SIERRA		
KINGS QUEST I	\$34.95	
KINGS QUEST II	\$34.95	
KINGS QUEST III	\$34.95	
SPACE QUEST	\$34.95	
WINNIE THE POOH	\$19.95	
SOFTWOOD COMPANY		
MIAMIGA FILE	\$79.95	
MIAMIGA LEDGER	\$79.95	
SPECTRUM HOLOBYTE		
GATO	\$39.95	
THE OTHER VALLEY SOFTWARE		
DELTA PATROL	\$19.95	
MONKEY BUSINESS	\$19.95	
VIP TECHNOLOGIES		
VIP PROFESSIONAL	\$134.00	

HARDWARE

COMMODORE PC 10-2	
640K, 2 DRIVES, MONO MONITOR	\$750.00
COMMODORE PC 10-2	
640K, 2DRIVES, COLOR MONITOR	\$825.00
FEATURES:	
8088 MICROPROCESSOR	
MS-DOS 3.2	
ATI GRAPHICS SOLUTIONS ADAPTER	
2 360KB DSDD 5.25" DISK DRIVES	
PC/XT COMPATIBLE BIOS	
5 FULL-SIZED EXPANSION SLOTS	
RS-232 SERIAL PORT	
GW-BASIC 3.2	
AMIGA 1680 MODEM	\$120.00
AMIGA 1080 COLOR MONITOR	\$299.00
COMMODORE 2002 COLOR MONITOR	\$299.00
AMIGA 1010 3.5" EXTERNAL DRIVE	\$199.00
AMIGA 1020 5.25" EXTERNAL DRIVE	\$199.00
AMIGA GENLOCK	\$225.00
STARBOARD II 2MB	\$510.00
XEBC 20MB HARD DRIVE	\$799.00
MAXELL DISKETTES	
MF2-DD	\$18.00
MD2-DD	\$10.00
MD2-HD	\$20.00
PRINTERS	
OKIMATE 20 WITH INTERFACE	\$199.00
EPSON EX800 W/COLOR	\$425.00
EPSON FX86E	CALL
EPSON FX286E	CALL
EPSON LQ2500	CALL
PRINTER CABLE	\$20.00
COMPUTER PAPER 8.5X11	\$12.95
EPYX JOYSTICK	\$19.95
OTHER HARDWARE IS AVAILABLE. PLEASE CALL FOR ITEMS NOT LISTED IN THIS ADVERTISEMENT.	

AMIGA IS A TRADEMARK OF COMMODORE-AMIGA INC.
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

1-800-423-7347 STARFLITE 1-800-423-7347

MC/VISA WELCOME

TELEMARKETING

P.O. BOX 685
NITRO, W.VA. 25143

lots of other ways to alter the visuals, like scrolling, bit-splitting, using the mouse to grab a brush, just hitting keys, timing, presets, or if your brain just overamps, the Evolve mode changes everything.

WHAT IT IS

I have a hard time evaluating Visual Aurals on any level this side of the astral plain. The program is incredibly complex, but it just puts colors and patterns on the screen. It is sophisticated, convoluted, overflowing with options that let you do incredible things to the colors and patterns on the screen. The programming wizardry and technical knowledge is apparent (it took some sort of genius to come up with Visual Aurals, I just can't pin down exactly what sort), but it just puts colors and patterns on the screen. The manual slips in and out of coherency. (When the screen goes blank they call it a Visual Void Space,

and you can "try the '?' to attempt to hyperspace out of a visual void space.") It has features that no other software developer ever thought about, and if any other developer ever thought of an option, Visual Aurals has it, but it still just puts colors and patterns on the screen. The program offers more options than DeluxePaint, Aegis Animator and WordPerfect combined *all to just put colors and patterns on the screen!*

Perhaps Visual Aurals is a phenomenally complicated sight-sound-video-music-manual-options-and-menu puzzle or a brilliant time warp into the past and future. Perhaps it is an honest and sincere concept/product gone berzerk. Perhaps this is exactly the kind of thing that computers were invented for, and thousands of people will rush out to buy it (not to mention its promised successor, Visual Aurals III-D). I can't say.

Visual Aurals alters moving colors and shapes on the Amiga screen based on

the input of sounds. There are billions of ways this process may be modified. The program is very complex and varied. The manual is erratic. There are more options than anyone could possibly learn or use without months of exploration and experimentation (this is one of the fun things about Visual Aurals). It is neat, it is pretty spacey, and unless you are a member of an acid-rock band playing in the last psychedelic dungeon of the world, this product has no practical use whatsoever. Maybe it's not supposed to. You have to decide if it's worth the price.

—G. Wright

Visual Aurals
Visual Aural Animation
PO Box 4898
Arcata, CA 95521
707/822-4800
\$169
512K required.

Game Shorties

ARAZOK'S TOMB

IN ARAZOK'S TOMB, you are "a fearless and greedy reporter for a sensationalistic newspaper." Arazok was a kind of evil Druidic priest who went into the Netherworld and never came back. But an archaeologist has disappeared near Arazok's old Scottish stomping grounds, so you've taken off after him to help.

The graphics and interface are up to Aegis' usual high standards. As you come to new places, and new situations, a picture comes onto the screen to show you what you're seeing. Clear and colorful, they lend an appropriate aura to the adventure. The interface allows you to direct your character by typing commands into the text-entry window, but you can control some actions from the graphics screen itself. A compass rose lets you click a direction for quick course changes, and the pull-down menus help you handle your inventory, save games and select various options. Useful, attractive and quite friendly, this interface is definitely worth a look.

I'm not sure, though, that the rest of the game is. The parser is terribly primitive, and playing it is an exercise in frustration. There seems only one solution

to many of the puzzles, and none of them are particularly inspiring. For example, the game has a Push command, but will not allow Pull. You can Put an object inside another, but if doing so is not the solution to the puzzle, the object will simply drop to the ground. Since the graphics screen shows each object on the ground, dropping or taking an object means a picture update, which in turn means more disk access. To avoid the frustration, you become unwilling to try all possible actions.

One other thing. You have a magic candle, and a book tells you how to light it. Fine, except that it runs out after a while. Fine, too, except that you can't move once it's out. Instead of letting you grope for the candle, Arazok's Tomb says you've stumbled and died. That means starting over, which means more waiting for the disk. The game seems to treat the player as an idiot.

If the quality of the game were close to that of the graphics, Arazok's Tomb would be something to behold. As it is, its value is highly suspect. (\$39.95,

Aegis Development, 2210 Wilshire Blvd., Santa Monica, CA 90403, 213/392-9972. No special requirements.)

—N. Randall

PHANTASIE III

THE DARK LORD Nikademus has set his evil sights on conquering not just a single island, but the entire world this time. Your job is to assemble a band of six stalwart beings (from humans, dwarves, elves, gnomes, halflings or 10 other types of creatures) from six classes (fighters, priests, monks, rangers, thieves or wizards) each possessing higher or lower values for five main attributes (strength, intelligence, dexterity, constitution and charisma) and varying degrees of skill in areas like fighting, lock picking, listening, spotting traps and so on. Once you have a band together, you set out from town to explore, fight, gather treasure, clues and experience which you can trade for training, weapons, armor, magic spells and such. In this way your band becomes stronger and more skilled in the not-so-subtle art of survival in a world inhabited by over 80 types of monsters, and where most learning is by trial and error (errors usually being fatal).

There is an awful lot going on in this sequel to the popular games Phantasie I and II. Each character has two or three screens of information which detail what

they are carrying, how many points they have in the different areas, what spells they know, and even which parts of their bodies are okay, hurt, broken or missing. Like most games of this type it is hard to get started (just about every monster out there can beat a novice group), so it is a good idea to stick close to town and save the game as often as you can. The documentation, mostly lists of weapons, creatures, spells, potions, options and commands, requires a very careful read, and a few items are left out.



Good (bottom) vs. Evil in Phantasie III.

Phantasie III is more of an epic quest than a simple hack-and-slash adventure. The graphics are good for this genre, but not breathtaking. There is simple animation of the characters during battles but this is by no means an arcade-style game (each character's moves can be carefully thought out even in the heat of fighting).

Phantasie III is a good conversion of a classic role-playing adventure game. It will probably be frustrating at first as your characters get killed over and over, but once they advance a few levels it will be difficult to turn the computer off. It is a good mix of sci-fi fantasy and strategy. It doesn't take as much concentration as a war game simulation or a text adventure, but it is more stimulating than a simple shoot-'em-up game. You get attached to the characters as they advance through the levels, and even if you never solve the game it is very enjoyable. Dust off your book of spells, oil the armor, keep your shield high and may the gods favor you. (\$39.95, Strategic Simulations, 1046 N. Pendstorr Ave., Mountain View, CA 94043, 415/964-1353. 512K required.)

—G. Wright

THE BLACK CAULDRON

LIKE THE MOVIE of the same name, The Black Cauldron is geared toward youth. Strangely, this focus makes it perhaps the strongest of Sierra's releases. Using joystick, mouse or keyboard, you guide Taran through the 3-D world, with your mission firmly in mind. The interface is smooth, and even the Use Object function is easy to use.

Particularly impressive is the "Do" command. While most adventures force you to decide exactly what to do in each location, Black Cauldron allows you to command your character simply by hitting the F6 key; the game then tells you whether or not there is anything worth doing. At one point for instance, you see a tree with a hole in the trunk. Instead of typing "Go to the tree and look inside," you walk Taran to the tree and press F6. The screen tells you that you see a lute. Press F6 again and you have taken the lute. The process may sound simplistic, but it is extremely friendly.

I found only one annoying flaw. As animation for the Sierra series was originally designed, the character moves in only four directions on the screen. He can go left, right, away from you, or towards you, but he cannot move diagonally. In play, this means that walking on anything drawn on an angle requires a series of left-right movements, in addition to the towards-or-away direction. Climbing stairs for example, demands shuffling Taran's body until he looks to be dancing. Not only is this silly to watch, it also affects play. In one especially trying sequence, Taran must climb a rope up to a cliff. Climbing is a series of lefts, rights, ups and overs, and because of the way the rope is drawn, the pattern is inconsistent. The result is that Taran frequently falls.

I have nothing against making rope climbing challenging, but this particular method is far from satisfactory. On an Amiga, where diagonal movement should be easy to implement, this represents a distinct flaw. It's hardly major though, and still the quest is enjoyable and quite addictive. The graphics are good, and the gameplay is even better. (\$49.95, Sierra On Line, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. 512K required.)

—N. Randall ■

AMIGA Hardware Software

Lowest prices on all
Amiga hardware

**30% OFF LIST PRICE
ON ALL SOFTWARE**

Word Perfect only
\$200

RSISystems
1-800-752-RSIS
1-800-752-7747

20% RESTOCKING FEE ON ALL ITEMS
RETURNED

Circle 154 on Reader Service card.

MCP Associates, Inc.

New York's Premier AMIGA Specialists.
(You may have visited us at AMI EXPO, now we invite you to our Retail Store, located in Queens, only minutes from mid-Manhattan.)

THE DISK SPECIALISTS-DISTRIBUTORS
C.ITOH, FUJITSU KASEI, SONY, Etc:
3.5" **DSDD** and **DSHD**

100% Certified-Lifetime Warranty!

Boxed	Bulk
Price per Box	Price per Disk
DSDD-Blue	DSDD-Blue
1-3 \$15.95	50 \$1.25
4-9 14.95	100-350 1.20
DSDD-Rainbow	DSDD-Rainbow
1-3 \$24.95	50 \$1.49
4-9 23.95	100-350 1.45

*includes case

Shipping/Handling: \$5.00 min., plus \$3.50 per 100 disks. NY residents add Sales Tax. For COD's, add \$5.00. MasterCard/Visa Accepted-min. purchase-\$50.00. We ship worldwide. Quantity Pricing available.

Authorized AMIGA Dealership—all configurations. WRITE/CALL for AMIGA Product & Price Listings, Disk Pricing Schedules, & specialty Products Listings. Educational, Corporate, and Dealer Inquiries Invited.

Exceptional Service & Quality
MCP Associates, Inc., P.O. Box 6260,
Dept. AW, L.I.C., N.Y. 11106-0260
(718) 956-9000

Circle 162 on Reader Service card.

WHAT'S NEW?

*We've got toasters, aliens, languages, alien languages, memory
(oh, have we got memory) and lots more in the closet.*

Compiled by Linda Barrett and Barbara Gefvert

SUPRASTARS

Now making its debut is the compact **SupraModem 2400**. The SupraModem plays a supporting role for asynchronous operation at 300, 1,200 and 2,400 bits per second. You can configure the unit, then store configurations so that they'll automatically load. It is compatible with AT commands as well as Bell 103/212A, CCITT V.22 and CCITT V.22bis protocols. It features automatic answer and dial and two modular jacks. For \$179.95, power adapter and

telephone cable are included; software packages (including Amiga cables) are available, as well.

Also entering the spotlight is the **SupraDrive FD-10 Removable Floppy Drive**. This system offers floppy flexibility with a 10MB capacity, and promises near hard-drive speed with average access time of 80 milliseconds. You can press it into service as primary storage or as a data backup device. The FD-10 allows the exchange of information



The compact modem from Supra Corporation.

between computers; each removable 5½-inch diskette stores up to 10MB of data. The unit connects to a SCSI interface and commands \$1,095 per performance, including software and cables.

For fan club information contact Supra Corporation, 1133 Commercial Way, Albany, OR 97321, 503/967-9075.

LIVE! THRIVES

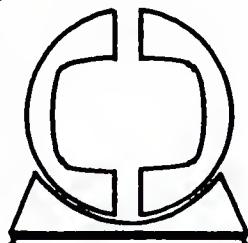
As reported in the November '87 issue, **LIVE!**, the real-time video framegrabber for the 1000, is shipping. The unit plugs into the expansion port, and offers two RCA-style jacks. The first accepts NTSC video signals from your video source, while the second sends the signal out for viewing, video equipment or a genlock. According to A-Squared, the digitize and display rate of moving images is 15 frames

per second. You even have a choice of display modes—a 16-level gray or a 32-color moving image. You can apply color maps to the image, then change them with the mouse. Images are saved in IFF format, so they are compatible with most paint programs. For a more extensive description, contact A-Squared Distributions Inc., 6114 La Salle Ave, Suite 326, Oakland, CA 94611, 415/339-0339.

TWO SLICES OF VIDEO

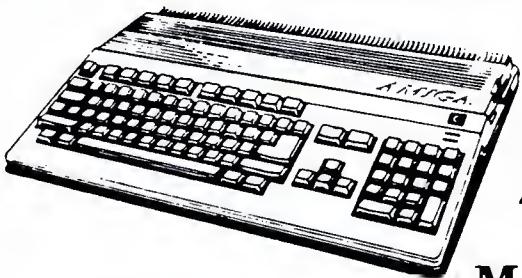
Videos and digital effects will be popping out all over, thanks to **Video Toaster** from NewTek. A comprehensive video system, Video Toaster integrates a genlock, frame capture and digital video effects. Genlock output is broadcast quality RS-170A standard, while the frame capture nabs a full-color, NTSC-standard frame in $\frac{1}{60}$ th of a second. Supporting all resolution modes, the frame buffer lets compatible software run in millions of colors. You can manipulate videos in real time and evoke broadcast-quality effects. Some of the pre-programmed effects are page flips and turns, spheres, montages, pushes, splits, transpositions, blinds and moving blinds, pixelizations,

fish-eye, stop motion, mosaic and hourglass. Promised expansions to the Toaster include real-time image processing support, a TMS 34010 video co-processor, a professional-quality chroma-key and NTSC paint program plus a programmable video switcher. A bit more expensive than traditional toasters, the Video Toaster retails for \$799.95. Order your electronic breakfast from NewTek Inc., 115 West Crane St., Topeka, KS 66603, 913/354-9332. ▶

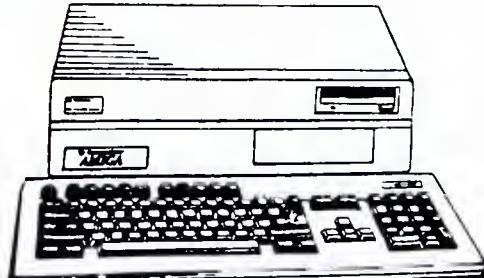


CREATIVE COMPUTERS

Orders Only: 800-872-8882 All Other Calls: 213-394-7779
(outside of California) 9 AM To 7 PM Western Time



COMMODORE
AMIGA



ONLY AMIGA^R
MAKES IT POSSIBLE.

CALL FOR PRICES ON AMIGA 500 and 2000 SYSTEMS

AMIGA 1680 MODEM	CALL	DOS TO DOS	\$37.82	GOLDEN PYRAMID(GAMESHOW)	\$24.03	PRO VIDEO CGI	\$144.00
AC FORTRAN	\$199.00	DOUG'S MATH AQUARIUM	\$49.98	GOLDRUNNER	\$24.98	PRO VIDEO SET #1 OR 2	\$72.00
AEGIS DRAW PLUS CAD SFTWR	\$162.48	DYNAMIC DRUMS	\$49.98	GRABBIT	\$20.59	PROWRITER	\$78.10
AEGIS SONIX	\$49.98	DYNAMIC WORD	\$124.38	GUILD OF THIEVES	\$29.98	RETURN TO ATLANTIS	\$29.97
AIRBALL	CALL	DYNAMIC CAD	\$340.32	HARDBALL	\$28.12	ROAD TO MOSCOW	\$29.97
ALL ABOUT AMERICA	CALL	EARL WEAVER BASEBALL	\$36.00	HEAD COACH	\$39.95	ROADWAR 2000	\$27.47
ALTERNATE REALTY: THE CITY	\$28.80	EASYL 2000	CALL	KNIGHT ORC	\$29.95	SHANGHAI STRATEGY GAME	\$27.48
AMIGA TRACKBALL	\$39.95	ECE MIDI 500	CALL	JET	\$31.95	SINBAD AND FALCON	\$34.34
ANALYTIC ART GRAPHICS	\$37.48	EPIX STATION MANAGER	\$199.95	JEWELS OF DARKNESS	\$19.95	SPRIT 1.5 MB FOR A500	\$420.00
ANIMATOR JR	\$49.38	EXPRESS PAINT	\$82.50	KARATE KID II	\$27.97	STAR GLIDER	\$29.95
AUDIO MASTER	\$37.48	FACC FLOPPY ACCELERATOR	\$21.85	KING OF CHICAGO	\$34.34	SUPERBASE	\$93.73
AUTODUEL	\$34.95	FAERY TALE ADVENTURE	\$31.23			SUPERBASE PROFESSIONAL	CALL
AZTEC 68: AM D	CALL	FERRARI GRAND PRIX	CALL			TELEGAMES	\$23.95
BARBARIAN	\$25.77	FINANCIAL PLUS	\$184.40				
BLACK JACK ACADEMY	\$29.95						
FIRE POWER \$14.60							
CHESSMASTER 2000	\$32.40	FLIGHT SIMULATOR II	\$31.95	LEXCHECK (NEW VERSION)	\$28.85	TEST DRIVE \$34.95	
CITY DESK	\$98.75	FORMS IN FLIGHT	\$44.95	LINKWORD LANGUAGES	\$20.55	THE CALLIGRAPHER	\$82.50
CLIMATE	\$24.98			LURKING HORROR	CALL	THE MUSIC STUDIO IFF	\$34.35
D'BUDDY	\$49.98			MARAUDER II-DUPLICATION	\$27.47	THE PAWN	\$29.95
DARK CASTLE	CALL			MAXIPLAN PLUS	\$124.40	TIMESAVER	\$57.97
DEFENDERS OF THE CROWN	\$34.34			MEGAMIGA 2MEG FOR A1000	CALL	TURBO	\$15.60
DELUX MUSIC CONST. SET	\$83.95			MICROFICHE FILER	\$69.95	TV TEXT	\$62.32
DELUXE PAINT II	\$83.95			MUSIC X	\$184.98	VIDEO VEGAS	\$24.10
DELUXE VIDEO 1.2	\$83.93			PROFESSIONAL PAGE	\$247.50	VIDEOSCAPE 3D	\$124.98
DEVELOPERS TOOLKIT	\$36.22			PERFECT SOUND DIGITIZER	\$67.47	VIZAWRITE	\$93.75
DIGI PAINT	\$41.22			PHASER FIN'L MGMT	\$82.48	WINTER GAMES	\$24.95
DIGI VIEW	\$143.72	GIZMOZ 2.0	\$43.73	PORTAL ADVENTURE GAME	\$34.35	WORD PERFECT	\$222.20
DISK TO DISK	\$34.34	GO 64 EMULATOR	\$52.95	PRO STUDIO	\$129.95	WORLD GAMES	\$24.95
FRAME BUFFER (MIMETICS) CALL							
GENLOCK (MIMETICS) \$149.95							
SILVER CALL							

Partial List. Call for any Items not listed.
If possible, drop by our store and you will be
Amazed!

Store front address:
318 Wilshire Blvd,
Santa Monica, Ca 90401



MINIMUM ORDER: \$20

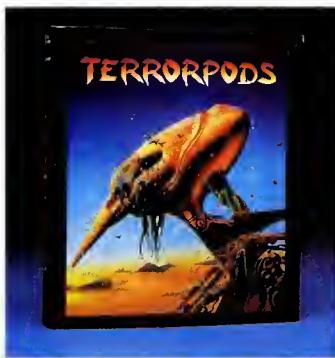
SHIPPING INFO: Call for shipping rates (We only charge standard UPS rates).

RETURN POLICY: Defective merchandise under warranty will be repaired or replaced. Returned product must be in original package.

REFUND POLICY: We do not offer any refund on defective products or for products that do not perform satisfactorily. We make no guarantees for product performance.

MINERS AND MEDDLERS

All is not well on the mining asteroid of Colian, the **Terrorpods** have landed. A combination of arcade shooting and bartering strategy, Terrorpods from Psygnosis casts you as an



A Terrorpod on the loose.

undercover Federation Agent assigned to discover the manufacturing secrets of the

HOLD STEADY

MicroWay has eliminated the Amiga 2000 jjjj-jitters with **FlickerFixer**, a video graphics enhancer. Designed to connect with multi-scanning monitors such as the NEC, MultiSync and Sony Multiscan, FlickerFixer stills flicker and eradicates visible scan lines. The board fits into the A2000's video slot and can handle resolutions up to 704 x 470 with overscan. For \$595, FlickerFixer is available from MicroWay, PO Box 79, Kingston, MA 02364, 617/746-7341.

EASIL-Y DONE

Previously offered only for the A1000, the pressure-sensitive **Easyl** graphics tablet is now available for the 500 and 2000. The 500 version is \$399, while the 2000 model sells at \$499. Draw up your order and send it to Anakin Research Inc., 100 Westmore Drive, Rexdale, Ontario, Canada M9V 5C3, 416/744-4246.

evil Empire's ultimate fighter, the Terrorpod (similar to, but more advanced than the *Star Wars* Walkers), and find the materials to build your own. In your Defense Strategy Vehicle, you can ramble about the asteroid, send a drover to trade with each of the 10 colonies for the resources you need and, of course, fight off the Terrorpods when they discover your true purpose. To satisfy both their American and European clients, the manufacturers have included a Nationality Selection screen, which lets you choose the language the game's text will be displayed in. For transport to Colian, contact Psygnosis Ltd.'s U.S. distributor, Computer Software Services, 2150 Executive Dr., Addison, IL 60101, 800/422-4912.

FRACTAL BEAUTY

The distinct disciplines of science and art are combined in **Analytic Art**, a program that allows you to generate complex graphics through Henon plots, the Mandelbrot and Julia sets and Sierpinski gaskets. You don't have to be a mathematical genius to create images. Analytic's creators emphasized composition and colors rather than computation. Three utilities let you elaborate on work produced with this or any other graphics program. Spheres maps art onto spheres or ellipsoids, while Gallery enables you to add effects such as color animation and evolution. The 3-D program puts your creations into any 3-D perspective view, and gives you the option of color-driven Z heights. You can purchase a copy of the program from Crystal Rose Software for \$64.35 (including shipping). Contact them at 109 S. Los Robles Avenue, Pasadena, CA 91101-2417, 818/795-6664.

GETTING BETTER ALL THE TIME

The latest AmigaDOS C compiler upgrade from Lattice is here. With its in-line interface to all Amiga ROM functions, **Version 4.0** supports 16- and 32-bit integers and reduces subroutine calls with its built-in ANSI functions, which are among over 250 functions included in the expanded library. Blink has also been upgraded, and now provides an option to aid debugging, true overlay support and the

ability to pre-link unchanging modules. Lattice includes Blink and an assembler compatible with all Amiga syntax along with the compiler. The compiler is priced at \$200; the upgrade price is \$75, but you will not be charged if you purchased your program after August 1, 1987. Compile your questions and direct them to Lattice, 2500 South Highland Avenue, Lombard, IL 60148, 312/916-1600.

TWO PARTS TO BOOT

There are two parts to the new **auto-booting hard-drive system** for the Amiga 1000 from Comspec. The hard-drive chassis allows for mounting of two hard drives or a hard drive and a tape streamer, a SCSI controller board, a power supply, SCSI daisy-chain connectors and a fan. The other half, the SCSI host adaptor, provides auto-boot circuitry, a small computer systems interface port and battery backup clock. You can add new devices to the open-ended SCSI driver, and up to 10 hard drives (from 10 to 300 megabytes) to the host

adaptor. The adaptor can boot Kickstart and Workbench from hard disk, and an intelligent SCSI controller chip handles many drive operation tasks, thus freeing up the CPU. In case of a media defect, the hard-disk driver software is able to automatically replace a defective block with a block from the reserved section of the disk. Comspec Communications Inc., who sells the unit for \$1,495 (\$1,150 for Comspec owners), may be reached at 153 Bridgeland Ave. Unit 5, Toronto, Ontario, Canada M6A 2Y6, 416/785-3553. ▶



Driving duo: adaptor (connected to bus) and chassis (right).

Check Their Ad

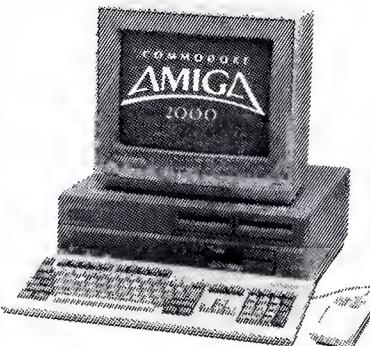
then

CHECK OUR PRICE!

ARKANOID	\$30
A2000 HDD CONT.	\$Call
MARAUDER II	\$2400

1084 MON	\$275
Digi-View Camera	\$200
BRIDGE CARD	\$Call

GENLOCK	\$200
1010 Drive	\$200
1680 Modem	\$120



AMIGA™

500/2000

SPECIAL PROMO... \$CALL

Pro Drive	\$180
512K RAM	\$120
256 K RAM	\$7000

2 MEG	\$350
40 MEG	\$950
20 MEG	\$650

1 MEG	WITH (Internal) \$280
CLOCK	

abssoft
AC/Basic.....\$117
AC/Fortran....\$180
ACCESS Software Incorporated
Leader Board.....\$30
Tournament Disk.....\$12
Tenth Frame.....\$30
ACCOLADE
Mean 18.....\$30*
Famous Courses V-2.....\$12
Test Drive.....\$27
Hard Ball.....\$27
ACTIVISION
Champ Basketball.....\$27
Gamemaker.....\$30
Golf.....\$27
GFL Football.....\$27
Hacker.....\$15
Hacker II.....\$27
Little Comp People.....\$15
Music Studio.....\$36
Shanghai.....\$27
Beyond Zork.....\$30
Lurking Horror.....\$24
AEGIS
Animator/Images.....\$84
Art Oisk.....\$24
Draw.....\$75
Draw Plus.....\$150
Images.....\$24
Impact.....\$54
Videoscape 3D.....\$120
Sonix.....\$48
Arazok's Tomb.....\$30
Diga.....\$48
AMIGA
Lisp.....\$120
Assembler.....\$60
Mindwalker.....\$30
Amiga C.....\$90
BEST SOFTWARE
Best Financial.....\$265
BROWN WAGH
Zuma Fonts (Each).....\$21
TV Text.....\$60
Publisher 1000.....\$120
CENTRAL COAST
DOS 2 DDS.....\$31
Disk to Disk.....\$30
INFOCOM
All Titles Available.....40% OFF

DIGITAL CREATIONS

Digital Link	\$45
Gizmos 2.0	\$42

DISCOVERY SOFTWARE

GRABBIT	\$22
Marauder II	\$24



JDK IMAGES

Pro Video CGI	\$120
---------------	-------

JHM	\$20
Talking Color Book	
Call For Current Pricing	

FINALLY SOFTWARE

Phasar	\$60
Talker	\$42
Dr. Xes	\$30

MANX

Aztec C-Devil	\$180
Aztec C-Commercial	\$300
Aztec C-Professional	\$Call

METACOMCO

Shell	\$42
Assembler	\$60
Toolkit	\$30
Lisp 1.3	\$120
Pascal	\$60

MICRO ILLUSIONS

Discovery-Math/Spell	each
Dynamic CAD	\$300
Faery Tale Adv.	\$30

MicroProse

F-15 Strike Eagle	\$24
Silent Service	\$24

MICROSMITHS

TxD	\$24
Fast Fonts	\$24

MINDSCAPE

Balance of Power	\$30
Bratacus	\$30
Deja Vu	\$30
Halley Project	\$30
Keyboard Kadet	\$30
Shadowgate	\$30
Racter	\$30
SAT Preparation	\$54
Def of the Crown	\$30
S.D.I.	\$30
Sinbad	\$30
Indoor Sports	\$30
King of Chicago	\$30

MICROSYSTEMS SW

Analyze 2.0	\$90
BBS PC	\$60
Online	\$42
Scribble	\$60
Organize	\$60
Flipside	\$30

SONY-FUJI-MAXELL

5 1/4 DS/DD	\$130
(30 Lot)	

3 1/2 DS/DD	\$180
-------------	-------

1080i-II	\$160*
----------	--------

1091i-II	\$180*
1092i	\$280*

1592i	\$380*
1524i	\$520*

*W/2 Ribbon Purchase	
----------------------	--

Disk Case(30)	\$8
---------------	-----

Disk Head Clnr	\$8
----------------	-----

DISKS

3 1/2 DS/DD	\$130
(30 Lot)	

3 1/2 DS/DD	\$180
-------------	-------

SONY-FUJI-MAXELL	
------------------	--

5 1/4 DS/DD	\$130
-------------	-------

100 Lot Min.	\$30
--------------	------

With Everything	
-----------------	--

Disk Case(30)	\$8
---------------	-----

Disk Head Clnr	\$8
----------------	-----

MIMETICS

Pro Midi Studio	\$125
Midi Interface	\$40
Sound Sampler	\$80
Soundscape Utilities	\$Call

Progressive Peripherals

Vista Write	\$90
SuperBase	\$80
Micro-Lawyer	\$36
Climate	\$24

subLOGIC

Flight Simulator	\$32
Jet	\$32
Scenery Disks	\$17

TDI

Modula II Devl	\$90
Modula II Commercial	\$180
Modula II Reg.	\$60

TRUE BASIC, INC.

TrueBasic	\$60
9 Libraries (each)	\$30
Runtime	\$90

UNISON WORLD

Art Gallery I, II	\$18
Printmaster Plus	\$30

W RELEASES NEW RELEASES N

Silver	\$108
Time Bandits	\$24
Air Ball	\$24
Fire Power	\$15
Roadwar Europa	\$24
Football Facts	\$36
Dark Castles	\$24
Terrorpods	\$24
Girls	\$12
Mousetrap	\$12
Animator Apprentice	\$180
Masterplus	\$90
Black Jack Academy	\$24
Arkanoids	\$30
Amigen	\$150
Superbase Professional	\$Call
Garrison	\$32
Game Titter	\$Call
Echilon	\$30
Californian Games	\$24
Destroyer	\$24
Animate 3D	\$90
Indoor Sports	\$30
Gauntlet	\$30
Works	\$120
Comic Setter	\$60
Intro Cad	\$48
Pixmate	\$42
Live!	\$Call
Newsletter Fonts	\$Call
Studio Fonts	\$Call
Color Separator	\$Call
TV Show	\$Call
Plutos	\$18
Studio Magic	\$Call
Reason	\$Call
Perfect Vision	\$Call
Ports of Call	\$30
Moebius	\$36
Text Pro	\$48
Data Retrieve	\$48

MODEMS

Avatex

1200.....\$80*
1200HC.....\$100*
1200INTERNAL.....\$90*
2400HC.....\$200*
 PRACTICAL PERIPHERALS
2400.....\$1600*
 KISS ENGINEERING
2400INT.....\$15000
*W/CABLE PURCHASE

Panasonic Industrial Company

DISKS

3 1/2 DS/DD (30 Lot)	\$130
3 1/2 DS/DD	\$180

SONY-FUJI-MAXELL

1080i-II	\$160*
1091i-II	\$180*
1092i	\$280*
1592i	\$380*
1524i	\$520*
*W/2 Ribbon Purchase	

ALPS ALQ 200 18 PIN/COLOR

240 C.P.S. DRAFT	\$399.95
1 Yr Warranty	
100 C.P.S. L.Q.	
Epson/IBM Comp	
 Free Tractor Feed	

No Surcharge for MC/VISA/DISCOVER

All returns must have RA#. Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.

12864 FARMINGTON ROAD, LIVONIA, MI 48150

Sorry no walk in traffic
All returns must have RA#. Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.

We cannot guarantee compatibility.

**ORDERS 800-433-7756
ONLY IN MICH. 313-427-7713 M-F
FAX: 313-427-7766 10-6
CUSTOMER SERVICE 313-427-0267
Monday thru Friday — 10:00 A.M. to 8:00 P.M.
Saturday — 10:00 A.M. to 6:00 P.M. (E.S.T.)**

M.C.S.
MICROCOMPUTER SERVICES

NO JEOPARDY HERE

"I'll take complete software development systems for \$249, Jack." "Okay. The answer is: 'This system provides the Modula-2 programmer with a high-speed, single-pass compiler that translates ASCII files into 68000 code, and compiler support of many Amiga-specific features. The editor reports errors in plain text, and the linker joins compiled modules into a runnable program in seconds. Also included are all Amiga operating system definitions and many basic libraries.'" "I know! 'What is the M2 Amiga?'" To claim your M2 Amiga, contact Interface Technologies, the US distributor, 3336 Richmond Suite 200, Houston, TX 77098, 713/523-8422.

BOARDS TO BEEF UP MEMORY

Computer Expansion Products has extended its line of **memory expansion boards**. To your A500 you can add an internal 512K memory and clock board (with or without RAM) and several external expansion cards, including 0-8MB and two-megabyte RAM with or without a SCSI hard-drive controller. Amiga 1000 options include two and 0-8 meg external boards and a SCSI controller either alone or with a two-megabyte expansion board. They offer three cards for the 2000—two megabyte, 0-8MB and two meg with SCSI hard drive. All boards are auto-config, offer no wait state memory access and self-contained power supplies where applicable, and may be installed by the user. Retailing between \$95 and \$1,495, they can be purchased from Computer Expansion Products Inc., 3596 South 300 West, #10, Salt Lake City, UT 84115, 801/264-8238.

BOXES AND BLOCKBUSTERS

Banking on the theory you can never have enough memory, Byte by Byte offers the **Byte Box** for the 500. The Byte Box will expand your 500's memory by up to two megabytes of zero wait state fast RAM. The memory boards are socketed with 256K DRAM chips, so you can buy an unpopulated board and enlarge it at your own pace. The companion memory-checking software alerts you of bad memory chips, bent pins and the like. The auto-config system connects to the expansion bus and has a power supply, which turns itself off when your Amiga is shut off. The Byte Box retails for \$299.95 at OK, \$399.95 for 512K, \$499.95 for one meg and \$699.95 for two megabytes.

With all that new memory, you'll have plenty of space to experiment with **Animate 3-D**, which puts your Sculpt 3-D renderings in motion. Using a script language or graphic interface, you control object rotation, camera movements, timing and action. Your animation can include either

solid modeling or ray tracing and you can link objects together for hierarchical movements. To check the results, you can play back a wire frame of your creation from a compressed animation file. Provisions also were made for single-frame VCR control and image rendering to a frame buffer card. You specify key frames per scene in a tri-view screen (similar to Sculpt 3-D); "in-betweening" for moving and rotating objects is automatic. You can metamorphose objects in shape and size, assign segmented and cubic spline paths for objects, the observer and light sources; apply velocity and motion blur to smooth curves plus enhance RAM-based animations with digitized sound. Animate 3-D sells for \$149.95, but you'll need Sculpt 3-D as an object editor before you can begin creating your Emmy-winning production. Contact Byte by Byte Corp. for details, at Arboretum Plaza 11, 9442 Capital of Texas Highway North, Suite 150, Austin, TX 78759, 512/343-4357.

GARGANTUAN GRAPHICS

Using a standard IFF file from any Amiga graphics program, you can create larger-than-life letters and anything else (up to eight and a half feet in height) with **HUGEprint**, the multi-tasking mural printer program. HUGEprint supports any graphics printer that has an Amiga driver. You can round up a copy for the not-so-huge price of \$48 (plus shipping and handling) at Hugh's Software Ranch, 50 East End Ave., New York, NY 10028, 212/879-4651.

ADDED SECURITY

Whether you're a tightrope walker or you'd just like to protect your hard-disk-based data, it's nice to have a **saf-T-net** handy. Invocable from Workbench or the CLI, the utility offers as-needed automatic formatting and 907.5K of data per floppy. Balance these and its many other features with the selling price of \$49.95, and then contact RSN Software Inc., 4122 South Parker Rd., Aurora, CO 80014, 303/690-0102.

LET'S HEAR IT FOR TEAMWORK

The combined efforts of Ameristar Technologies and ASDG Inc. have yielded a package of Ethernet networking hardware for the Amiga 1000. Ameristar's **A2000 Ethernet board** (which, along with its software, allows you to link Amigas with equipment by other manufacturers) fits into one of five A2000 slots on ASDG's platform, the **2000-and-1**. The 2000-and-1 will also accommodate two A1000 boards, three IBM PC/AT cards, the A2000 86-pin CPU slot and, internally, up to three hard disk, tape or floppy drives. The ASDG 2000-and-1 backplane/Ameristar Ethernet package, priced at \$1,399, discounts the price of the components purchased separately by \$299. Contact Ameristar Technologies at PO Box 415, Hauppauge, NY 11788, 516/698-0834. You can reach ASDG Inc. at 280 River Road Suite 54A, Piscataway, NJ 08854, 201/540-9670.

ON EVERY SCREEN

A genlock for the masses, **AmiGen** from Mimetics is compatible with all Amigas and comes in both NTSC and PAL versions. Promising a NTSC RS-170A broadcast standard image, AmiGen overlays Amiga graphics on external video sources and will synchronize the Amiga's video image with any external source. For the 500, AmiGen provides composite color video output, and the RGB Thru connection allows all models to use their usual monitors with the genlock plugged in. The unit is priced at \$179.95. To get in sync, aim your video cameras at Mimetics Corp., PO Box 60238 Station A, Palo Alto, CA 94306, 408/741-0117. ■

Don't miss the boat...



with Amiga expansion products

SubSystem™ A2000

The Advantage™

A two megabyte RAM expansion card for use in the Amiga 2000 and the SubSystem.

- No-wait-state design
- Auto configures with all Amiga 1.2 software
- Designed to A2000 form factor
- Very low power consumption
- User may install inexpensive 256Kx1 dynamic RAM

Unpopulated (0K)	\$199
Populated (.5, 1 or 2 MEG)	CALL

SubSystem™ A2000

OverDrive™

Direct Memory Access (DMA) SCSI Interface. Just because you have an Amiga 500 doesn't mean that you don't want the speed of DMA. Using the SubSystem with our A2000 card gives you what others only offer to A2000 owners. No matter what Amiga you own, Pacific Peripherals makes a SCSI for you. Our SCSI offers you compatibility with proven Apple Macintosh external storage devices. As a matter of fact, all of our drives are Macintosh compatible. If you use the SCSI in your A2000 you have an additional bonus...the ability to add a hard drive **inside** your Amiga and still use external devices. In addition to 30 megabyte and 50 megabyte (and larger) drives, Pacific Peripherals offers the Infinity removable media drive. Once you have purchased the Infinity, you have **unlimited capacity**. Each 10 megabytes of memory costs a whopping \$18. (Does 100 megabytes for \$180 sound more impressive?) With all this capacity you still get 75ms access time.

OverDrive card only	\$249
OverDrive "hardcard"	CALL
External Hard Drives	CALL

A500 A1000

SubSystem™

Use cards designed for the A2000 with your A500/1000, not out-of-date A1000 cards. The SubSystem gives you two expansion slots for A2000 cards and a space for an optional second floppy drive. The SubSystem fits under your Amiga, completely out of the way. Only 1.5 inches tall, the SubSystem raises the keyboard to the height of an average typewriter and actually makes it easier to use. A UL/CSA-approved power supply is included that guarantees additional cards will not overtax your Amiga. The optional floppy drive is state-of-the-art CMOS design with extremely low power requirements. Cards and disk drive can be easily installed at a later date.

New!	\$249
with floppy drive	\$399

SubSystem 1000

FOR AMIGA 1000

(415) 651-1905

Pacific
Peripherals

P.O. Box 14575
Fremont, CA 94539

Policy: Add 3% for VISA or Mastercard. Allow 3 weeks for checks to clear. Send cashiers checks or money orders for faster shipment. California residents add 7% for sales tax. No charge for UPS ground delivery. Next day and 2nd day delivery available. Prices subject to change.

Infinity is a trademark of Peripheral Land. Macintosh is a trademark of Apple Computer Inc. Amiga is a trademark of Commodore Business Machines. Cage II, the Advantage, SubSystem are trademarks of Pacific Peripherals.



Circle 107 on Reader Service card.

HELP KEY

Help me Help Key! Help, Help me Help Key!

Help me Help Key, yeah . . . get me out of this mess!

By Louis R. Wallace

SEE THE LIGHT

Q: I am getting an A500 but can't afford a 2002 monitor right away. Can I use the monochrome output with a TV, or can I change the RGBA output to composite video?

T. G.
Idyllwild, CA

A: C Ltd has developed an interface called the C-View, which is designed to convert the Amiga 500 (or 2000) RGBA signal to a standard composite video output such as that used by the C-64's 1702 composite monitor. You should also be able to use it with a monitor-type TV that is equipped with composite video input connections. Or, you could run it into a VHS player and then out to a TV. C-View's retail price is \$49.95, about the same price as a monochrome composite monitor, which is what the monochrome output was designed for.

Commodore supposedly has an Amiga RF modulator for the A500 called the A520, but I haven't been able to find any details on it.

UNKNOWN FORMAT

Q: As a new A500 owner I have been trying to learn the CLI using AmigaWorld articles and The AmigaDOS Manual, 2nd Edition. Since I have only one drive, I copy the C directory to RAM, then assign C: to RAM using ASSIGN. Everything works fine, ex-

cept FORMAT, which prompts an Unknown Command message! I have looked in the C directory and it isn't there, nor is there a command called INITIALIZE. Where the heck is the format command? Is it in ROM? If so, why doesn't it work from the RAMDISK?

S. Forstein
Sioux Falls, SD

A: Your problem is the result of a discrepancy between the version 1.1 and 1.2 AmigaDOS disks. On the earlier AmigaDOS disks, FORMAT was indeed in the C directory. In the new systems, it has been given an icon and moved to the SYSTEM directory. It now can be used either from the CLI or Workbench. From the CLI, type: SYSTEM/FORMAT DRIVE DF0: NAME "disk-name" (the DF0: can be any drive). If you want to have it in RAM, just copy it over into your RAMDISK resident C directory.

CIRCUITOUS SIMULATIONS

Q: I am an electronics teacher at a technical institute in Milan, Italy. I would like to use my A1000 for designing and simulating analog circuits. Is there an analog circuit simulator program available?

P. Castellotti
Milan, Italy

A: At this writing, there is no software available for simulating an analog circuit. LogicWorks, the only circuit

simulation software I know of, is strictly for digital circuits. LogicWorks is available for \$299.95 from Capilano Computing, PO Box 86971, North Vancouver, B.C. Canada V7L 4P6, 604/669-6343.

A GREEK GENIE

Q: I am planning on starting a newspaper for the Greek neighborhood I live in. I would like to use Greek in the newspaper, but I am having trouble finding a font with Greek characters. Is there any public domain software that includes a set of Greek characters?

S. Thomopoulos
New York, NY

A: On the GENIE network, Library 14 (Fonts and Icons) of the Amiga Software Exchange has many public domain fonts, including MATHFONT.ARC, which contains Greek characters. While intended as a mathematical font, perhaps it will help you. The file is less than 4K and downloads very quickly. You will need the file's number (2687) to download it and either ARC or DEARC (both are on GENIE) in order to extract it. The .ARC extension means the file consists of several different files that have been compressed and linked together to make them easier to download. Your terminal software must support XMODEM, which is the protocol used by the GENIE network for uploading and downloading.

For information on GENIE itself, dial 800/638-9636.

RAMMED FONTS

Q: I am using the Comspec two-meg RAM board. By copying DeluxePaint II, DigiPaint, Butcher 2.0 and Digi-View into the RAM disk, I can switch between them so fast it's like they were all one giant program. Even more importantly, the loading and saving of images is speeded up dramatically. How do I install the FONT directory on the RAM disk so the graphic programs will work with it in RAM?

D. Garon
Duluth, MN

A: All you need do is use the CLI to create a small batch file (RAMFONT, for example) that can be executed when you start up your system. Type:

```
MAKEDIR RAM:FONTS
COPY DF0:FONTS ALL
RAM:FONTS
ASSIGN FONTS:
RAM:FONTS
```

RAMFONT creates a duplicate of the FONTS directory in RAM, copies all your fonts to the new directory, then instructs the Amiga to use this RAM directory (via the AmigaDOS ASSIGN command) instead of the disk-based font directory. To execute these instructions, type EXECUTE RAMFONT or include them in your startup sequence where they will execute automatically when you boot Workbench. ■

Fast Times with Benchmark Modula-2

T.M.

Benchmark offers a programming environment so easy-to-use, so comprehensive, so failsafe, and so fast you can't wait for your next session at the computer. No more wasting time wondering is it the compiler or your code. Benchmark creates a hassle-free environment which allows you to concentrate your energy on programming, instead of fighting the compiler. Leon Frenkel, the developer of Benchmark, debugged the product so you don't have to.

Benchmark delivers:

Fast Compile Speeds: Compiles average 10,000 lines per minute with burst speeds of 30,000 lines per minute to give you phenomenal boosts in productivity.

Reliability: If your code doesn't compile, you don't have to be concerned about the compiler. In addition, Benchmark's environment makes it extremely easy to edit your corrections and then proceed to recompile.

Convenience: All major activities can be executed from the EMACS style Editor with function keys. With Benchmark it is literally:

- F2 for Compile
- F3 for Link
- F4 for Run

Optimized Code: Resultant program size and speed optimized to be similar to programs written under Aztec 'C'.

Full Documentation: Benchmark's 700 page manual includes examples of every procedure, in addition to the quick reference available on menus.

Source Code Demos: Most programmers learn by example. Over 100 demo programs included which can be incorporated in your own programs.

Expandability: Benchmark offers three add-on libraries of highly useful functions and routines.

► Benchmark 'C' Language Standard Library: Includes functions to help easily move programs written in 'C' into Benchmark's state-of-the-art programming environment. Offers the capability to include advanced 'C' language functions in Modula-2 programs such as: printf, fprintf, scanf, fscanf, fopen, fclose, fseek, open, close, create, lseek, malloc, calloc, free, etc.

► Benchmark Simplified Amiga Library: Includes routines which are common to nearly every Amiga program. Saves weeks of programming and debugging with functions for screen creation, window creation, menu creation, console handling, port handling, speech synthesizer handling, graphic elements, gadget creation, double buffered

animation handling, and many others.

► Benchmark IFF and Graphic Image Resource Library: Includes a set of functions for handling IFF Format Files and for Incorporating bit-mapped images to be integrated into Modula-2 programs as a resource. Supports three types of formats: Intuition or BOB format, Simple Sprite, and Virtual Sprite Format.

You have the choice of either using Benchmark's EMACS style Editor with its menus listing frequently accessed commands and their key equivalents or using your own favorite Editor.

Benchmark's integrated environment with the Editor frees you from having to list errors, look up the line number of an error, and then loading in the Editor to correct the error.

Benchmark Modula-2: Software Construction Set comes with:

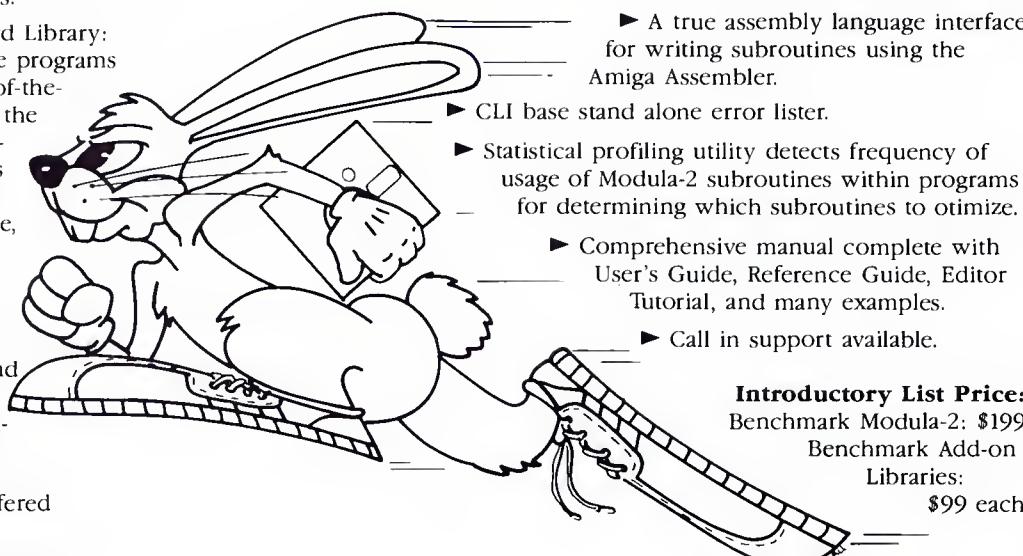
- Amiga hardware/software support libraries including: Intuition, ROM Kernel, Amiga DOS, Workbench, etc.
- Standard Modula-2 libraries including: FileSystem, InOut, Storage, Terminal, MathLib8, etc.
- Over 100 demonstration programs, complete with source code, show the usage of many of the Amiga functions such as windows, graphics, multitasking, menus, and gadgets in programs such as a free-hand paint program, desktop calculator, gadget based directory maintenance program, ray tracing programs, etc.
- A fast cross reference utility for both user and system created libraries.
- Utility for loading large numbers of files quickly into RAM based disks.
- A true assembly language interface for writing subroutines using the Amiga Assembler.
- CLI base stand alone error lister.
- Statistical profiling utility detects frequency of usage of Modula-2 subroutines within programs for determining which subroutines to optimize.
- Comprehensive manual complete with User's Guide, Reference Guide, Editor Tutorial, and many examples.
- Call in support available.

Introductory List Price:

Benchmark Modula-2: \$199

Benchmark Add-on Libraries:

\$99 each



To learn more about Benchmark contact
your Amiga Software Dealer or

Oxxi inc.

P.O. Box 4000
Fullerton, CA 92634
(213) 427-1227

Circle 8 on Reader Service card.

AMIGA

introducing . . .



EXTEND is a portable Library of 30 new AmigaBASIC commands that bring the Pizzaz of INTUITION into your AmigaBASIC programs

TRUE INTUITION REQUESTERS and GADGETS

- * Point & click on directory requester gadgets for ease in loading and saving files
- * String and boolean gadget implementation with polling support
- * Custom string requesters

MENU CONTROL

- * Complete menu attribute control
- * Assignment of command key functions
- * Submenu definition

SPEED

- * Written in 100% assembler
- * Compatible with all tested compilers

EASE of USE

- * No program overhead
- * Invoked with a simple LIBRARY statement

Extend Your Horizons for only \$ 59.95

ALSO AVAILABLE

VIDEO CATALOGER * Organize your videotape collection

HOME INVENTORY * In the event of loss could you list everything you own? \$ 34.95 each

MAIL ME * Manage lists. Make labels.

VISA / MC Accepted
Dealer Inquiries and
Phone Orders
Welcome

**SPECIAL
INTRODUCTORY
OFFER**
EXTEND + any other
ONLY \$ 79.00

**SATISFACTION
GUARANTEED**
Compatible with all
Amiga models

SUNSMILE SOFTWARE
533 Fargo Ave. Buffalo NY. 14213
716 / 885-5670

Circle 171 on Reader Service card.

Amiga 500/1000/2000

Quality Products At The Lowest Prices

Amiga 500	\$549	Animate 3D	\$108
Amiga 1000	CALL	Arkanoid	\$37
Amiga 2000	CALL	Deluxe Paint II	\$89
1084 Monitor	\$299	Diga!	\$45
501 Ram Card	\$159	Digi-Paint	\$44
Amiga 1010 Drive	\$219	Flight Simulator II	\$37
1300 Genlock.....	\$209	Hardball	\$34
2088 Bridgeboard	\$535	Marauder II	\$29
2090 SCSI Board	\$325	Pagesetter	\$112
2052 2MB RAM	\$399	Prowrite	\$86
2010 3.5 Internal	\$160	Sculpt3D	\$65
Xebec 9720H	\$799	Sonix	\$45
Starboard2 1MEG	\$399	Superbase	\$104
Starboard2 MFM	\$77	Videoscape 3D	\$115
Insider 1 MEG	\$319	VizaWrite	\$104
DigiView	\$149	Word Perfect	\$219

Call For The Latest Products & Prices



Most items ship the same day
Customers are not billed until the products ship



SPRITE TECHNOLOGY

In Ga. Call
404-535-8806 (800) 634-9315 Mon-Fri 9-6 EST

Amiga is the registered trade mark of Commodore Business Machines

from p. 48

```

int ReadClip(); /* Read a cut from clipboard, re- */
/* turns # bytes read. */
void CloseClip(); /* Close clipboard */
void WriteClip(); /* Write data to clipboard */
void show_buf(); /* Little hex dumper routine */
void clip_ifff_str(); /* Writes string to clipboard
in IFF form Notepad can read */
void close_up_shop(); /* Clean-up routine */
/* Main Program - no arguments */
main ()
{
    char consbuf[81]; /* To read from console */
    char clipbuf [1024]; /* Up to 1K reads at a time */
    int nread; /* # bytes read from clipboard */
    /* Basic Scheme - Open Console, Open ClipBoard
Loop, doing:
    Get 1-character command from user- read or quit
    If quit, exit loop
    else check contents for IFF formatted text (FTXT)
        if there, print out text as ASCII
        otherwise, dump as hex data
    Pause between windowfulls
End Loop
Close up shop and quit */
/* Open graphics library so DOS can make window */
if ((GfxBase = (struct GfxBase *) OpenLibrary
("graphics.library", 0)) == NULL)
{
    printf ("Can't open graphics library\n");
    exit (1);
}
closeflags |= CL_GFXLIB;
/* Open console window to talk to user through */
if ((cons = Open ("CON:10/90/620/100/ClipDemo",
MODE_OLDFILE)) == 0)
{
    printf ("Can't open a console window\n");
    close_up_shop ();
    exit (2);
}
closeflags = CL_CONSOLE;
if ((clipreq = OpenClip (0)) == NULL)
{
    Write (cons, "Open error on clipboard\n",33);
    close_up_shop ();
    exit (3);
}
closeflags |= CL_CLIPDEV;
for (;;) /* Loop until inside decides to quit */
{
    (void) Write (cons, "Next: R (read clip),
W (write one), Q (quit) ? ", 47);
    (void) Read (cons, consbuf, 80);
    /* We really only look at first char */
    if ((*consbuf == 'q') || (*consbuf == 'Q'))
        break;
    else if ((*consbuf == 'r') || (*consbuf == 'R'))
    { /* Else we read a.clip */
        nread = ReadClip (clipreq, clipbuf, 1024);
        /* And display what we read */
        show_buf (clipbuf, nread);
    }
    else if ((*consbuf == 'w') || (*consbuf == 'W'))
    { /* Get a string, write it in FTXT format. */
        Write (cons, "Enter up to 80 chars--\n> ",25);
        nread = Read (cons, consbuf, 80);
        clip_ifff_str (clipreq, consbuf, nread);
    }
    else
        Write (cons, "R, W, or Q only, please!\n", 25);
}
close_up_shop ();
exit (0);
} /* end main */
/* show_buf -
Display contents of a buffer read from the
clipboard as hex and ASCII.
Args:
```

```

buf: Data from clipboard.
nbytes: Number of bytes in buf.
Returns: Nothing.
Notes:
A better version would diagnose data to
see if was IFF FTXT which we could
display as simple ASCII. Exercise left
to the reader (I always wanted to say
that!) See clip_ifft_str for format. */
void
show_buf (buf, nbytes)
char *buf;
int nbytes;
{
int nleft;
int i,j;
char *bufptr; /* To traverse buf */
char conbuf[60]; /* 60 char wide dump */
char *cptr; /* To write into conbuf */
int endcnt; /* Loop control */
int hinyb, lownyb; /* Nybbles of current byte we're
hexifying */
/* Hex/ascii dump */
nleft = nbytes;
while (nleft > 0)
{
    for (i=0; i<DFLT_NLINES; i++) /* Do each line */
    {
        /* Init conbuf to blanks */
        cptr = conbuf;
        for (j=0; j<60; j++)
            *cptr++ = ',';
        cptr = conbuf;
        bufptr = buf;
        endcnt = min(nleft, 12); /* Twelve bytes per
line */
        /* Hex values first */
        for (j=0; j<endcnt; j++)
        {
            lownyb = (*bufptr) & 0xF;
            hinyb = (*bufptr >> 4) & 0xF;
            *cptr++ = hextab[hinyb];
            *cptr++ = hextab[lownyb];
            bufptr++; /* Next byte */
            cptr++; /* Blank between each number */
        }
        cptr = conbuf + 39; /* blanks in-between. */
        bufptr = buf;
        /* Now output char values;
           dots for non-printables. */
        for (j=0; j<endcnt; j++)
        {
            if ((*bufptr >= ' ') && (*bufptr <= '~'))
                *cptr = *bufptr;
            else
                *cptr = '.';
            bufptr++;
            cptr++;
        }
        *cptr++ = '\n';
        Write (cons, conbuf, (int) (cptr - conbuf));
        buf += endcnt;
        nleft -= endcnt;
        if (nleft <= 0)
            break; /* Done */
    } /* end for */
    if (nleft > 0)
    {
        Write (cons, "<Hit RETURN to see more> ", 25);
        Read (cons, conbuf, 60); /* wait for return */
    }
} /* end while */
} /* end show_buf */
/* clip_ifft_str -- Write string to clipboard in
simple IFF FTXT (formatted text) form.
Args:
    ioreq: IOClipReq to write to.
    buf: String for clipboard.

```

Listing continued on p. 92

AMIC DEVELOPMENT CORPORATION

"YOUR AMIGA TELECOMMUNICATIONS COMPANY"

INTRODUCES

AMIC 2000

\$39.95

The Amiga Magic Information Center

AMIC Term

\$59.95

THE FINEST TERMINAL PROGRAM

AMIC SPORTSTER PAK

US ROBOTICS 2400 BAUD MODEM + AMIC TERM + AMIC 2000 \$329.95

DEALER INQUIRIES WELCOME

FOR INFORMATION CALL BY VOICE TO ----- 707-579-1320
OR CONNECT TO AMIC 2000 BY MODEM ----- 707-579-0523

3426 MENDOCINO AVENUE
SANTA ROSA, CA 95401

VISIT US AT THE AMI EXPO IN LOS ANGELES - JAN. 16-18
ALSO AT THE COMMODORE SHOW IN SAN JOSE - JAN. 29-30

Circle 139 on Reader Service card.

Tired of Syntax?

AiRT Programming

Lets You...

...assemble groups of
pictures from our library of
over 80 functions to visually
construct a program!

Includes:

- AiRT Editor
- Compiler
- Print Utility
- Forms Picture Editor
- Extensive AiRT
Programming Manual

New Version \$64.95

Send check or Money Order to:

PDJ Software

111 Thornwood Dr.
Marlton, NJ 08053
(609) 596-8991



1.2 Kickstart

512K Amiga Required

AiRT is a trademark of PDJ Software • AMIGA is a trademark of Commodore-Amiga

Circle 215 on Reader Service card.

AmigaWorld 91

Programming the AMIGA?

THE LANGUAGES AND TOOLS YOU NEED ARE HERE -
FROM METACOMCO, THE AUTHORS OF AMIGADOS

MACRO ASSEMBLER

Professional macro assembler, this is THE assembler package for the Amiga. Standard 68000 mnemonics, macro expansions, over 160 explicit error messages, fully formatted listings, large range of directives, absolute, position independent or relocatable code and conditional assembly.

\$99.95

"... 68000 programmers will want to take advantage of this assembler's sophistication" Your Amiga - Sept 1987

TOOLKIT [NEW VERSION]

An invaluable suite of program development utilities. Includes Make, Disassembler, Pipes, Librarian, Pack and Unpack, Browse and AUX CLI. A package designed by the authors of AmigaDOS to extend the power of the operating system.

\$49.95

"Likely to become one of the most used programming aids for the machine" Your Commodore - Feb 1987

METACOMCO

26 Portland Square, Bristol BS2 8RZ, UK.
Telex: 444874 METACO G Fax: 44 272 428618

© METACOMCO 1987

Amiga and AmigaDOS trademarks of Commodore/Amiga Inc

SHELL

An enhanced command line interpreter to ease and speed up your development cycle. Contains Unix like features such as Command Line History, Command Line Editor, Aliases, Variables and Push and Pop directories. Also full documentation of Amiga CLI commands is provided.

\$69.95

"It's well worth the money to anyone who uses the Amiga DOS CLI" Amiga World - June 1987

MCC PASCAL

A fast and efficient ISO validated Pascal compiler generating native code, comprehensive error handling, 32 bit IEEE format floating point and full 32 bit integers.

\$99.95

"The definitive Pascal compiler for the Amiga" Amiga User - Dec. 1986

CAMBRIDGE LISP

An integrated LISP interpreter and compiler providing a complete Artificial Intelligence development environment with rational arithmetic, trig functions, floating point arithmetic, vectors, integers of any size and much more.

\$199.95

"One of the most advanced LISP systems I have ever seen" Amiga World - Feb. 1986

from p. 91

nbytes: Number of bytes in string.
Returns: Nothing.

Notes:

The format of the clip is:

Bytes 1-4: "FORM"

Bytes 5-8: Length of string plus 12
(length of rest of clip)

Bytes 9-12: "FTXT"

Bytes 13-16: "CHRS"

Bytes 17-20: Length of string

Bytes 21-n: String. */

void

clip_ifff_str (ioreq, buf, nbytes)

struct IOClipReq *ioreq;

char *buf;

int nbytes;

{

long len;

if (!nbytes) /* Nothing to write */

return;

WriteClip (ioreq, "FORM", 4, WCLIP_FIRST_WRITE);

len = nbytes + 12;

WriteClip (ioreq, &len, 4, WCLIP_CONT_WRITE);

WriteClip (ioreq, "FTXT", 4, WCLIP_CONT_WRITE);

WriteClip (ioreq, "CHRS", 4, WCLIP_CONT_WRITE);

len = nbytes;

WriteClip (ioreq, &len, 4, WCLIP_CONT_WRITE);

WriteClip (ioreq, buf, nbytes, WCLIP_LAST_WRITE);

}

/* Cleanup Routine - closes and deallocates things based on flags set in "closeflags" */

void

close_up_shop ()

{ /* Close and terminate things in inverse order of their opening/allocation. */

if (closeflags & CL_CLIPDEV) CloseClip (clipreq);

if (closeflags & CL_CONSOLE) Close (cons);

if (closeflags & CL_GFXLIB) CloseLibrary(GfxBase);

/* end close_up_shop */

/* The following routines are some sample clipboard utility i/o routines: open a clipboard device unit, close it, read from it. */

/* OpenClip - Open a clipboard unit

Arguments:

unit: Clipboard unit to open

Returns:

IOClipReq struct to use for clipboard i/o

Notes: This routine does not create a "satisfy" message port to answer satisfy messages after doing a CMD_POST. If your application will be POSTING data, you should create a satisfy port here as well to pass back to your caller. */

struct IOClipReq *

OpenClip (unit)

int unit; /* ClipBoard unit to open */

{

register struct IOClipReq *ioreq;

struct MsgPort *port; /* I/O msg port */

int err_code; /* Error from OpenDevice */

if ((ioreq = (struct IOClipReq *)

AllocMem (sizeof (struct IOClipReq),

MEMF_PUBLIC | MEMF_CLEAR)) == NULL)

return (NULL);

if ((port = CreatePort (NULL, 0)) == NULL)

{

FreeMem (ioreq, sizeof(struct IOClipReq));

return (NULL);

}

if ((err_code = OpenDevice ("clipboard.device",

unit, ioreq, 0)) != 0)

{

RemPort (port);

FreeMem (ioreq, sizeof(struct IOClipReq));

return (NULL);

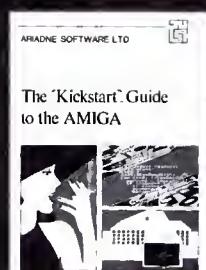
}

ioreq->io_Message.mn_ReplyPort = port;

ioreq->io_ClipID = 0; /* Make sure empty */

return (ioreq);

Your Key to Learning The AMIGA™



The 'Kickstart'™ Guide to the AMIGA™

A most comprehensive guide to operating the AMIGA™
A best seller in Europe finally offered in the US!

ORDER LINE

(800) 222-4441

\$24.95

Add \$2.50 shipping and handling
Illinois residents add 6.25% sales tax
C.O.D. orders add additional \$2.00
Make payable to Midnite Press

ADRIADNE SOFTWARE LTD with Midnite Press

Distributed by Micro Pace, Inc. 1212 Hagan, Champaign, IL 61820
Dealer inquiries welcome

```

) /* end OpenClip */
/* CloseClip -- Close an open clipboard unit.
Arguments:
    ioreq: IOClipReq struct for clipboard
Returns: Nothing. */
void
CloseClip (ioreq)
struct IOClipReq *ioreq;
{
/* Free the associated message port, then */
/* close the clipboard device itself. */
CloseDevice (ioreq);
RemPort (&(ioreq->io_Message.mn_ReplyPort));
FreeMem (ioreq, sizeof(struct IOClipReq));
} /* end CloseClip */
/* ReadClip -- Read a chunk of data from an
open clipboard unit
Arguments:
    ioreq: IOClipReq struct to read with
    buf:   Buffer to read bytes into
    bufsiz: Size of buffer.
Returns:
    Number of bytes actually read. */
int
ReadClip (ioreq, buf, bufsiz)
    register struct IOClipReq *ioreq;
    char *buf;
    int bufsiz;
{
    int length;
/* Get clip data */
ioreq->io_Command = CMD_READ;
ioreq->io_Data = buf;
ioreq->io_Length = bufsiz-1;
    /* So we can tack on '\0' */
ioreq->io_Offset = 0;
ioreq->io_ClipID = 0; /* Always do for first read */
DoIO (ioreq); /* Read it */
length = ioreq->io_Actual;
*(buf + length) = '\0';
if (ioreq->io_Actual < (bufsiz - 1)) /* Read all */
{ /* Terminate read so other programs can write to
    clipboard again. */
    ioreq->io_Command = CMD_READ;
    ioreq->io_Length = 1;
    ioreq->io_Data = NULL;
    DoIO (ioreq); /* Clear it out */
}
return (length);
} /* end ReadClip */
/* WriteClip -- Write a chunk of data to an open
clipboard unit
Arguments:
    ioreq: IOClipReq struct to write with
    buf:   Buffer to write out
    bufsiz: Size of buffer.
    whichone: Type of write - first, continuation, last.
Returns: Nothing. */
void
WriteClip (ioreq, buf, bufsiz, whichone)
    register struct IOClipReq *ioreq;
    char *buf;
    int bufsiz;
    int whichone;
{
/* Write clip data */
if (whichone == WCLIP_FIRST_WRITE)
{
    ioreq->io_Offset = 0;
    ioreq->io_ClipID = 0; /* Always do for first write */
}
ioreq->io_Command = CMD_WRITE;
ioreq->io_Data = buf;
ioreq->io_Length = bufsiz;
DoIO (ioreq); /* Write it to clipboard */
if (whichone == WCLIP_LAST_WRITE)
{
    ioreq->io_Command = CMD_UPDATE;
    DoIO (ioreq);
}
} /* end WriteClip */ ■

```

AC/FORTRAN™

Mainframe quality, full feature **ANSI FORTRAN 77** compiler includes: **Debugger**, Linker, Library Manager, Runtime Library, **IEEE** math, and **C** interface. Supports **Complex** numbers, **Virtual** arrays, **Overlays** and Linking. Not copy protected. \$295.

Version for CSA 68020/68881 Turbo board also available \$495.

AC/BASIC™

From the authors of **Microft BASIC** compiler for Macintosh, comes AC/BASIC for the Amiga. Companion compiler to the **Amiga BASIC** interpreter: has more features and includes **BLOCK IF**, **CASE** statement, and **STATIC** keyword extensions and executes up to **50x** faster. AC/BASIC is the new BASIC reference for MC68000 based personal computers. Not copy protected. \$195.

abssoft



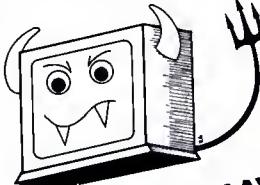
Scientific/Engineering Software

Telephone orders welcome

4268 N. Woodward, Royal Oak, MI 48072/(313) 549-7111

Amiga trademark of Commodore, Amiga. Microsoft trademark of Microsoft Corp.

Circle 175 on Reader Service card.

 **VIDEO MADNESS**
ARE YOU HAVING A DEVIL OF A TIME FINDING AN RGB CABLE?!
WE DO THE WEIRD AND UNUSUAL CABLES

Thompson - Panasonic - Magnavox
 Sears - Apple - Atari - Amiga - Mitsubishi
 JVC - Sony - Sanyo - Penney's - Custom

**\$29⁰⁰ to \$39⁰⁰ SHIPPED
 BLUE USA**

REDMOND CABLE
 REDMOND CABLE CORP.
 206-882-2009
 FOR THE DEALER
 NEAREST YOU

Circle 113 on Reader Service card.

AmigaWorld 93

The Pull-Down Menu

TAKE 5 AMIGA™ DISKS FOR ONLY \$29.95*

EXCELLENT SOFTWARE!	APDC COUPON BELOW	FOR AMIGA 500, 1000 & 2000.
GRAPHICS AND GAMES	APDC SPECIAL DISKS	UTILITY DISKS
<input type="checkbox"/> 001 Best Graphics & Games	<input type="checkbox"/> 002 Amiga Learner	<input type="checkbox"/> 015 Icons & Icon Utilities
<input type="checkbox"/> 007 Mandelbrot & Fractals	Fantastic tutorial disk.	<input type="checkbox"/> 017 Emacs Editors
<input type="checkbox"/> 008 Assorted Games	Excellent utilities and games.	<input type="checkbox"/> 019 Unix™-type Commands
<input type="checkbox"/> APDC's most popular disk!		<input type="checkbox"/> 021 Telecommunications
<input type="checkbox"/> 009 Graphics & Animations	<input type="checkbox"/> 011 Sounds	<input type="checkbox"/> 023 Word Processing Also
Eye-popping Amiga demos!	Edit and play sounds.	Databasing and Spreadsheets.
<input type="checkbox"/> 013 Interactive Graphics	<input type="checkbox"/> 018 General User Utilities	<input type="checkbox"/> 025 Programming Languages
Ray tracer, create 3D objects.	A must for the serious user.	Lisp, Fortran, and Modula-2.
<input type="checkbox"/> 014 Desktop Video	<input type="checkbox"/> 031 Amiga PD Artwork	

AUG

AMIGA USER'S GROUP of SJ

Join the largest user's group dedicated to the AMIGA. Receive our official newsletter. Evaluations on software and hardware, advanced updatings, technical information, problem-solving, program exchange (over 50 disks in our PD library), Buying discount service, etc.

Send \$18.00 US for Membership to:

AUG

Box 3761- Attn: Jay Forman-AW1

Cherry Hill, NJ 08034

(609) 667-2526 Add \$1.00



APDC ORDER COUPON

ENTER DISK NUMBERS DESIRED

BUY 10
TAKEN ONE
FREE!

SPECIAL OFFER
ANY 5 DISKS only \$29.95
ANY 10 DISKS only \$59.90

(SINGLE DISK PRICE: \$7.00)

* Add \$4 (\$7 foreign) CA residents also
shipping & handling. add 7% sales tax.

SPECIAL OFFERS INCLUDE 10-SLOT DISK CASE!

Send coupon (or copy) with check or money order to:

Amiga Public Domain Connection

-OR- APDC

BOX 9015 BERKELEY CA 94709

Allow 3 to 5 weeks for delivery (APO OK).

Full Name _____

Street _____

City _____

State _____

Zip Code _____

AMIGA SOFTWARE

Over 70 disks of only the best of the Public Domain and Shareware. Tested and sorted into the following categories:

Animation, Applications, Games, Graphics, Information, Music, Programming, Sound, Telecommunications, and Utilities.

For a free list, send a business size SASE to:

**Micro Computer Associates, Amiga Software,
P.O. Box 5533, Katy, TX 77491-5533.**

NO SCAN LINES! TOP QUALITY—FAST

SLIDES

NEW LOW PRICE!!

ANY IFF FILE PROCESSED DIRECTLY FROM YOUR DISK!
2k resolution 35mm slides \$6.75 each. Also digital color separations.

Now accepting Visa/MC, minimum order \$25.00.

Call or write for our full service list:

**ImageSet—555 19th St., San Francisco, CA 94107
(415) 626-8366**



Effective High-Tech/High-Touch products for Life-Improvement to gain greater control of your life and enjoy it more!

THE ATTITUDE ENGINEER™

Take a problem situation (person, place, . . .). Install power states. Generate exciting imagined experiences. And change the way you will actually deal with the problem! Really works! Get powerful results!

COMPUTER-AIDED RELEASE OF EMOTIONAL STRESS™

Anger, frustration, anxiety, fear, regret, sadness, loneliness, etc. Stressful, painful, even overwhelming. Do your emotions rule you? Gain control! Release stress anytime! Includes the use of patterns developed for Post-Traumatic Stress Disorder (PTSD) and some phobias. Not a replacement for therapy. Req. 512KB. Only \$39.95 each, both for \$69.95 (Massachusetts residents add 5% sales tax). Send check or money order to:

Neuro Dynamics, Inc., P.O. Box 733, Boylston, MA 01505



WE SHIP AROUND THE WORLD

Known internationally for exceptional service.

Knowledgeable, multi-lingual staff.

U.S. overseas personnel!

We specialize in APO & FPO shipping!

Ask for our Overseas Military Special Pricing!

Fast delivery, charged when shipped

COD, VISA, MC, M/O, Certified check

3826 Woodland Park Ave. N., Seattle, WA 98103

206-547-OMNI

206-547-6664

Fax 206-547-6012

COMPUTER MART

Your Texas Amiga Source
Immediate Access to over 400 Amiga Titles.
Prices too low to print!

We Stock Amiga Software and Peripherals
For A500, A1000, & A2000.

Mon. thru Fri. 10:00 AM-7:00 PM, Sat. 12:00-5:00 PM
CALL TOLL FREE
800-443-8236

CUSTOMER SERVICE
409-560-2826

Computer Mart • 105 Lynn Street • Nacogdoches, Texas 75961

MOUSE WASH - A SPECIALLY DESIGNED BALL THAT CLEANS THE INSIDE OF YOUR MOUSE WITH NO CHEMICALS!—\$7.95 ** **WINDOW PRINT II** DOES THE FOLLOWING—LOAD, SAVE OR PRINT OR CLIP PART OF SCREEN, IFF TO ICON MAKER, POSTER SIZE PRINTER, AND MUCH MORE! FOR THE 500, 1000 OR 2000 AND WORKS WITH IBM GRAPHICS ON THE AMIGA—\$34.95 ** **LIBYANS IN SPACE** - THIS IS A SUPER FAST PACED WAR SIMULATION IN SPACE, IT HAS GREAT DIGITIZED SOUNDS!—\$29.95 ** **GIVE YOUR MOUSE ROOM TO ROAM!** WITH **RAT PAD!** 10" x 12" OF ROLLING SPACE—\$11.95** ADD \$2 FOR SHIPPING OR \$3 FOR C.O.D.

T&L PRODUCTS, 2645 WILSON ST., CARLSBAD, CA. 92008, (619) 729-4020
AMIGA™ IBM™

APL.68000

\$99

A HIGHLY OPTIMIZED ASSEMBLER BASED APL INTERPRETER FOR FAST AND POWERFUL PROGRAMS. FEATURES A COMPLETE INTERFACE TO THE AMIGA ENVIRONMENT WITH PULL-DOWN MENUS, REQUESTER AND ALERT BOXES, SPEECH, SOUND AND GRAPHIC FACILITIES.

SPENCER
ORGANIZATION, INC.

Westwood, NJ 07625
P.O. Box 248
(201) 666-6011

Order Direct for \$99 + 7 shipping, \$10 Canada.
VISA/MC/AMEX + 4% NJ res. + 6% sales tax.

MicroEd

Educational Software K thru ADULT

SEND FOR A LIST OF OUR 29 AMIGA PROGRAMS. ALL USE VOICE. MANY USE DIGITIZED PICTURES.

MicroEd, Incorporated
P.O. Box 24750
Edina, MN 55424

LARGEST ENCYCLOPEDIA/CATALOG FOR DEDICATED COMPUTERS AND GAME UNITS

DIABLO —Graphic mind challenge game.....	\$29.95
Lottery Assistant —Increase your odds of winning as much as 500%	\$39.95
Strip Poker —Digitized nudes not drawing.....	\$29.95
FAST SERVICE • BIG DISCOUNTS MANY EXCLUSIVE PRODUCTS	
S&H—\$2.50 US	
S&H—\$4.50 CN	
US—\$'s ONLY	

M.W. Ruth Co. AMW1
3100 W. Chapel Ave.
Cherry Hill, NJ 08004
(609) 667-2526

If you have developed software or hardware we would be happy to sell it for you.
We also Market, Publish and Manufacture.

BUSINESS SOFTWARE

Payroll	Inventory	FREE CATALOG
Accts Receivable	Accts Payable	<i>call or write today!</i>
Check Ledger	General Ledger	(619) 436-3512

COMPUTERWARE®
Box 668-A Encinitas, CA 92024

MEGGIDO ENTERPRISES

You don't want to be without it!!!! It's here now—the Phone Directory of the future! Don't lose or misplace phone numbers and/or addresses of friends, business associates or that special "someone" you met at the mall. Just put them in your Computer Black Book, then when you want to call, scroll to the name, select RING, hold phone to computer speaker and your Amiga will dial for you (touch tone). Can also print mailing labels, personal phone directories etc. Use at home or the office as a rolodex; for kids as well as adults, practical or fun uses.

THE COMPUTER BLACKBOOK ONLY \$35.95

Save \$\$\$! Avoid leftovers! Convert recipes to actual serving needs. **RECIPE-FAX \$49.95**
Eat to live! Calculate nutritional values of your favorite recipes. **NUTRI-FAX \$139.95**
To order or for more information:

Meggido Enterprises, Box 3020-191-A02, Riverside, CA 92519

RGB VIDEO CREATIONS

presents
DELUXEHELP FOR DELUXEPAIN II

Use the Ultimate Tutorial System
2574 PGA BLVD, SUITE 104, PALM BEACH GARDENS, FL 33410

305-622-0138 305-622-7049 BBS

RETAIL \$34.95
+ SHIPPING

NEW

CHILDREN'S EDUCATIONAL PROGRAMS FOR YOUR AMIGA

Ages 8-14

Four educational activities designed to build essential word power skills

Superb graphics
Speech

\$49.95

THE WORD MASTER™
VOCABULARY BUILDER FOR GRADES 3-8

*Diagnostic Placement Test
*500 3rd-8th grade words and meanings
*Vocabulary Challenge Quiz
*Master's Maze Game

OTHER AVAILABLE TITLES

★ READ & RHYME ★ FRACTION ACTION ★ KINDERAMA
★ DECIMAL DUNGEON ★ READ-A-RAMA
★ ANIMAL KINGDOM ★ AESOP'S FABLES
★ MATH WIZARD ★ MAGICAL MYTHS

Free Catalog

2950 E. Flamingo
Greenview Plaza, Suite B
Las Vegas, NV 89121 (702) 737-8862

Circle 77 on Reader Service card

The Pull-Down Menu

AMIGAWORLD'S New Pull-Down menu is a great opportunity for those with AMIGA products to reach over 70,000 Amiga owners. AmigaWorld is the only publication with a subscription card in the box with every Amiga computer, national newsstand distribution by ICD Hearst, and single copy sales in computer stores carrying the AMIGA as well as large bookstores such as B. Dalton and Walden Books.

To reserve your Pull-Down Menu ad call Heather Paquette on the East Coast at 1-800-441-4403 or Danna Carney on the West Coast at 1-415-328-3471. We accept checks, money orders, MasterCard or VISA.

AMIGA - AMIGA
\$\$ SAVE \$\$ SAVE \$\$

AMIGA A500 PACKAGE	\$950.00
AMIGA A1000 ... CALL FOR AVAILABILITY	
AMIGA A1010 3.5 DRIVE	\$195.00
AMIGA A1030 MONITOR	\$289.00

WE CARRY A COMPLETE LINE.

SOFTWARE - PRINTERS - MODEMS
ELECTRONIC ARTS/EPSON/AVATEX
AEGIS/PANASONIC/MICROBOTICS
THIS AD WAS CREATED ON "PUBLISHER 1000"

SDA

MC/VISA
WELCOME

1-304-768-2178

CALL NOW

1308 OHIO AVENUE, DUNBAR, WV 25064
WV RESIDENTS ADD 5% SALES TAX

AMIGA - AMIGA

Circle 13 on Reader Service card.

AmigaWorld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina*; ASIA'S *Communications World*, *Computerworld Hong Kong*, *Computerworld Malaysia*, *Computerworld Singapore*, *Computerworld Southeast Asia*, *PC Review*; AUSTRALIA'S *Computerworld Australia*, *Communications World*, *Australian PC World*, *Australian Macworld*; AUSTRIA'S *Computerwelt Oesterreich*; BRAZIL'S *DataNews*, *PC Mundo*, *Micro Mundo*; CANADA'S *Computer Data*; CHILE'S *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark*, *PC World Danmark*; FINLAND'S *Mikro, Tietoviikko*; FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Telecoms International*; GREECE'S *Micro and Computer Age*; HUNGARY'S *Computerworld SZT*, *PC Mikrovilage*; INDIA'S *Dataquest*; ISRAEL'S *People & Computers Weekly*, *People & Computers Bi-Weekly*; ITALY'S *Computerworld Italia*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld Mexico*; THE NETHERLANDS' *Computerworld Netherlands*, *PC World Benelux*; NEW ZEALAND'S *Computerworld New Zealand*; NORWAY'S *Computerworld Norge*, *PC World Norge*; PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld*, *China Computerworld Monthly*; SAUDI ARABIA'S *Arabian Computer News*; SOUTH KOREA'S *Computerworld Korea*, *PC World Korea*; SPAIN'S *CIMWORLD*, *Computerworld Espana*, *Commodore World*, *PC World Espana*, *Comunicaciones World*, *Informatica Industrial*; SWEDEN'S *Computer Sweden*, *Mikrodatorn*, *Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; UNITED KINGDOM'S *Computer News*, *DEC Today*, *ICL Today*, *LOTUS*, *PC Business World*; UNITED STATES' *AmigaWorld*, *CD-ROM Review*, *CIO*, *Computer Currents*, *Computerworld*, *Computers in Science*, *Digital News*, *Federal Computer Week*, *80 Micro*, *FOCUS Publications*, *inCider*, *InfoWorld*, *Macintosh Today*, *MacWorld*, *Computer + Software News*, (*Micro Marketworld* Lebhar-Friedman), *Network World*, *PC World*, *Portable Computer Review*, *Publish!*, *PC Resource*, *RUN*, *Windows*; VENEZUELA'S *Computerworld Venezuela*; WEST GERMANY'S *Computerwoche*, *Information Management*, *PC Welt*, *Run*, *PC Woche*, *RUN*.

List of Advertisers

Reader Service Number	Reader Service Number
9 A-Squared, 25	*
124 Abacus Software, 53	Mindscape, 31
175 AbSoft, Inc., 93	102 Newtek, 1
139 Amic 2000, 91	38 New Horizon Software, 43
* <i>AmigaWorld</i>	21 Origin Systems, 58
<i>AmigaWorld Sub Ad</i> , 73	33 Oxxi, Inc., 17
<i>Pull Down Menu</i> , 94, 95	8 Oxxi, Inc., 89
42 Byte by Byte, CIV	215 PDJ Software, 91
59 C-Ltd., 44	107 Pacific Peripherals, 87
143 Central Coast Software, 77	169 Pioneer Computing, 89
* <i>Cinemaware Corp.</i> , 7, 9	159 Progressive Peripherals, 55
37 Computer Discount, 56	154 RSISystems, 81
41 Computer Mail Order, 32, 33	24 ReadySoft, Inc., 19
189 Computer Systems Assoc., 61	113 Redmond Cable, 93
199 Creative Computers, 83	204 Right Answers Group, The, 4
28 Digital Creations, 15	36 S&S Wholesalers, 71
46 Digital Solutions, 39	29 Software Digest, 4
89 Discovery Software, 12, 13	134 Software Shop, 75
26 GO AMIGO, 64, 65	10 Software Visions, 18
150 Gold Disk Inc., 5	211 SoftLogik, 41
212 Gold Disk Inc., 66	206 Sprite Technology, 90
4 Infinity Software, 2	116 Star-Flite Telemarketing, 79
100 Inovatronics, 69	57 Sunrise Industries, 49
80 Inovatronics, 69	171 Sunsmile Software, 90
50 Inovatronics, 69	208 Supra Corp., 50
162 MPC (Micro Computer) Assoc., 81	13 Systems Design Assoc., 95
31 Manx, Inc., 57	77 Unicorn Software, 95
16 Metacomco, 92	64 WordPerfect Corp., 29
44 MicroComputer Services, 85	
214 Micro Pace Distributors, 92	
138 Microllusions, CII	
37 Microllusions, CIII	
27 MicroSearch, 63	
45 Micron Technology, 47	

* This advertiser prefers to be contacted directly

This index is provided as an additional service. The publisher does not assume liability for errors or omissions.

Manuscripts: Contributions in the form of manuscripts with drawings and/or photographs are welcome and will be considered for possible publication. *AmigaWorld* assumes no responsibility for loss or damage to any material. Please enclose a self-addressed, stamped envelope with each submission. Payment for the use of any unsolicited material will be made upon publication. All contributions and editorial correspondence (typed and double-spaced, please) should be directed to *AmigaWorld* Editorial Offices, 80 Elm Street, Peterborough, NH 03458; telephone: 603-924-9471. **Advertising Inquiries** should be directed to Advertising Offices, CW Communications/Peterborough, Inc., 80 Elm Street, Peterborough, NH 03458; telephone: 800-441-4403. **Subscription problems or address changes:** Call 1-800-227-5782 or write to *AmigaWorld*, Subscription Department, PO Box 868, Farmingdale, NY 11737. **Problems with advertisers:** Send a description of the problem and your current address to: *AmigaWorld*, 80 Elm Street, Peterborough, NH 03458, ATTN: Lisa LaFleur, Customer Service Representative, or call 1-800-441-4403.

EBONSTAR

EbonStar is swift action competition wrapped in an electrifying arcade style format. Exceptionally unique and challenging, EbonStar will thrill you with its dramatic sound, realistic graphics, and options to four players and man vs man or machine. Seize the challenge of EbonStar, pick up your copy today!



ROMANTIC ENCOUNTERS

A true to life adult encounter for men or women! Permit your wildest imagination's to interact with the enticing scenarios of the DOME. At the DOME, you can set yourself up for what ever you are after... We promise you'll get what's coming to you!

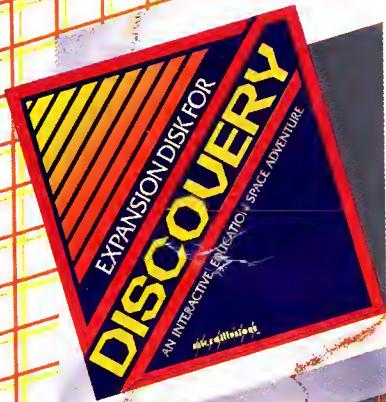


One of the Dome's alluring stories

The lounge, a place of enticing rendezvous

DISCOVERY EXPANSION DISK

Learning is an exciting adventure with DISCOVERY! Now you can expand your adventure with Discovery Expansion Disks: Math 1 • MATH CONCEPTS • SPELLING 1 • SPELLING 2 • TRIVIA 1 • TRIVIA 2 • SCIENCE • GEOGRAPHY • LANGUAGE • SOCIAL STUDIES • HISTORY



Control room of space ship Discovery

Working a solution to a math problem.

OTHER PRODUCTS FROM MICROILLUSIONS

- **PLANETARIUM™**
For the Serious Student of Astronomy
- **LAND OF LEGENDS™**
The ultimate dungeon adventure!
- **ONE TO ONE SERIES™**
Fire Power™, Galactic Invasion and Turbo™
- **BLACKJACK ACADEMY**
Everything you ever wanted to know about Blackjack
- **THE FAERY TALE ADVENTURE™**

All MicroIllusions Entertainment and Education products are developed especially for Amiga, C64/128, MAC, Apple II GS, and PC/MS DOS Formats

micro illusions

TM

17408 Chatsworth St., Granada Hills, Ca. 91344
Inside CA 818/360-3715 • Outside CA 800/522-2041 • FAX 818/360-1464
Circle 37 on Reader Service card

110AM

ROME WASN'T BUILT IN A DAY, UNTIL NOW . . .

Create your own universe with SCULPT 3-D™

SCULPT 3-D brings the power of 3 dimensional solid modeling and ray tracing to the Amiga. Imagine an image: choose a color, a shape, a texture. Spin it, rotate it, extrude it into the third dimension. Pick a camera lens, set your lights, and let SCULPT 3-D create a three dimensional picture complete with shadows, reflections, and smooth shading. All in 4096 colors with true edge to edge overscan video. Easily! Automatically! Change your mind? Change the colors, textures, camera or lights in seconds and create a new image. The only limits are the boundaries of your imagination.

"I haven't had this much fun with a program since Deluxe Paint II." John Foust of Amazing Computing.

"Performance previously only available on mini and mainframe computers." Info Magazine.



Now animate your universe with ANIMATE 3-D™

Enter the fourth dimension, time. Choreograph the free flowing and simultaneous movement of objects, lights and camera through space and time. Details of object rotation, camera movements, timing and action are controlled in an easy to use graphical interface or through a simple script language. Individual objects can be linked to orchestrate complex hierarchical movements that simulate live action. Quick check wireframe playback previews your final production: storable as a compressed animation file playable from RAM, or recorded on videotape. Additional output options include single frame VCR control or image rendering to a frame buffer card. Animations can incorporate either solid modeling or ray tracing. ANIMATE 3-D is quite simply the most powerful and easy to use animation program available for the Amiga.

Expand your universe with the BYTE BOX™

Your Amiga 500 deserves the best you can give it. More memory for more powerful applications, faster performance, better graphics, and RAM disk storage. It deserves a memory expansion system that lets you add additional memory as you need it. An easy to install and easy to afford increments. The included memory verify software provides a visual check whenever you add additional RAM. The BYTE BOX is available in a variety of configurations from 0MBytes to 2MBytes of RAM.

- Easy to install
- Fully Auto-Configure
- Fast memory that's truly fast
- Has its own power supply
- Fully tested and ready to use
- Zero wait state design
- Low profile case
- Memory check software



BYTE by BYTE
CORPORATION

Aboretum Plaza II 9442 Capital of Texas Highway North Suite 150 Austin, TX 78759 (512) 343-4357

SCULPT 3-D, ANIMATE 3-D, and BYTE BOX are trademarks of Byte by Byte Corporation.
Amiga is a trademark of Commodore-Amiga, Inc. Deluxe Paint II is a trademark of Electronic Arts.

Circle 42 on Reader Service card.

From Origin comes the long-awaited sequel
to the award-winning

Ultima™ III

Ultima IV

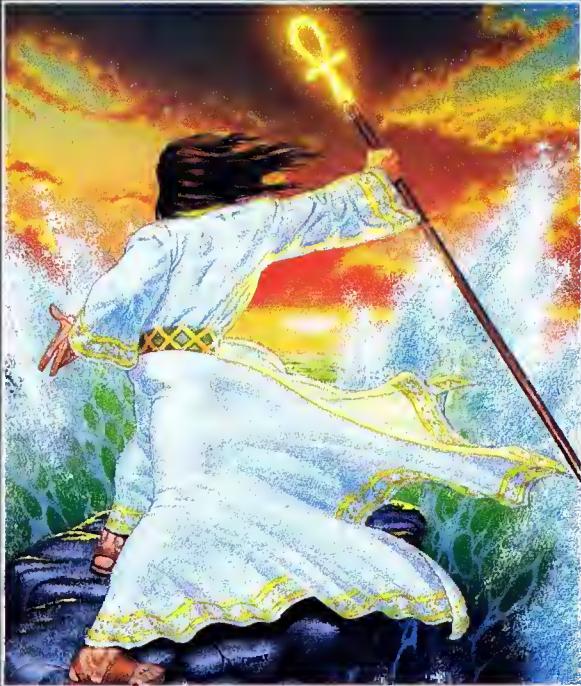
Quest of the Avatar

Available on Amiga.

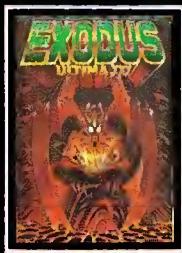
A state-of-the-art fantasy role-playing game of unprecedented magnitude by Lord British™.

Prepare yourself for a grand adventure: Ultima™ IV, sixteen times larger than Ultima III, is a milestone in computer gaming—one that challenges your physical and mental skills while testing the true fabric of your character. Enter Britannia, kingdom of Lord British. Journey through terrain of infinite proportions, conversing with characters on hundreds of topics. Unravel the mysteries of a superior magic system. At each turn beware of daemons, dragons and long-dead wizards haunting the most tranquil of places. Encounters with parties of mixed enemy types test your strategic abilities. Shrewd use of terrain can lead to victory against seemingly impossible odds.

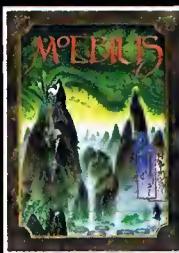
Survive this multi-quest fantasy, then begin the final conflict, your quest of the Avatar. The ultimate challenge—the self—awaits....



136 HARVEY ROAD, LONDONDERRY, NH 03053 (603) 644-3360



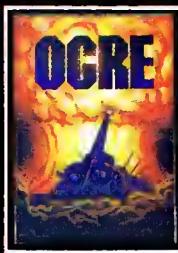
ULTIMA™ III sends you on an incredible fantasy role-playing journey through monster-plagued Sosaria in search of the elusive Exodus.



MOEBIUS™ takes you through the elemental planes of a colorful Oriental world of fantasy and adventure in search of the Orb of Celestial Harmony.



AUTODUEL™ is a futuristic, fast-paced strategy role-playing game where the right of way goes to the biggest guns.



OGRE™ is a strategy game fought on the nuclear battlefield of tomorrow as an inhuman juggernaut Cyber-tank battles conventional forces.

Ultima and Lord British are trademarks of Richard Garriott/Moebius is a trademark of Greg Malone/AutoDuel and Ogre are trademarks of Steve Jackson/Apple is a trademark of Apple Computer Inc/Previous Ultimas are not needed to enjoy Ultima IV Authors wanted. Call us today.